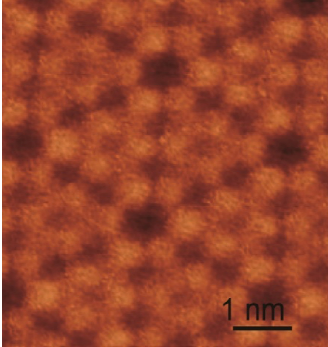
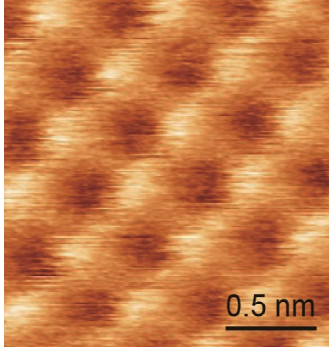
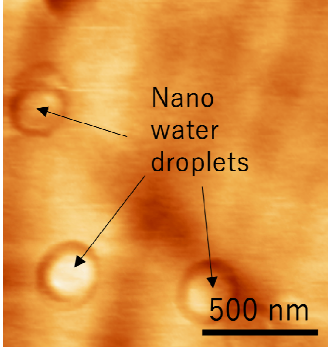
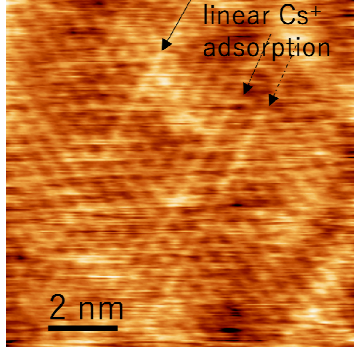


Division of Mathematical and Physical Sciences	Research field	Nano Physics	Lab. ID MP08
Laboratory web site	http://nanophys.w3.kanazawa-u.ac.jp/		
Research subjects			
<p>Nanophysics is a research field that seeks to observe and analyze interactions and interfacial phenomena occurring at the atomic and molecular scales, aiming not only to discover new physical phenomena but also to develop them into emerging technologies. In our Nanophysics Laboratory, we employ atomic force microscopy (AFM) to investigate a wide range of environments, including vacuum, air, and liquid, enabling the visualization and analysis of the behavior of water, ions, and molecules at and near solid surfaces with atomic and molecular resolution. Through these approaches, we address fundamental questions such as “How are atoms structured at solid surfaces and interfaces?” and “How surrounding water and additives participate in reactions and mass transport?” while also pursuing the control of interfacial phenomena toward the development of novel material functions and applications in environmental and energy-related technologies. The figures below present examples of high-resolution imaging of various sample surfaces obtained using instruments developed and refined in our laboratory.</p>			
			
FM-AFM image of a Si(111)7×7 surface in ultrahigh vacuum(UHV)	FM-AFM image of a KBr (100) surface covered with a thin water layer in air	Nano water droplets on glass surface under humid air.	Clay surface with adsorbed Cs ions in solution
Master/Doctor course: Education policy, curriculum, typical activity in the laboratory			
<p>Nanophysics is an emerging field developed from solid-state physics and surface science. In our seminars, students read and present from specialized textbooks and introduce research papers related to their work. We also offer a “Fourth-Year Seminar,” where graduate students provide undergraduates with the knowledge needed to conduct research. Explaining their work to others helps graduate students deepen their understanding and strengthen their foundations.</p> <p>We encourage participation in conferences and the publication of research papers. Doctoral students are required to submit papers and present internationally, while master’s students are expected to aim for international presentations.</p>			
Daily life in the laboratory, etc.			
<p>Students are encouraged to work in the laboratory on weekdays with a regular schedule. Some continue extracurricular activities or part-time jobs. Because low-noise conditions are often required, students may work at night or on weekends and adjust their schedules accordingly. Graduate students are expected to manage their time independently and engage in research proactively.</p>			
Message or comments by the laboratory faculty staffs			
<p>The students first build the basics to study by utilizing their knowledge learned in their undergraduate courses. We welcome students who actively engage in exploring new nanoscale phenomena.</p>			
Laboratory mail address	Toyoko Arai <arai *at* staff.kanazawa-u.ac.jp>, Yuki Araki<y-araki *at* staff.kanazawa-u.ac.jp>		