

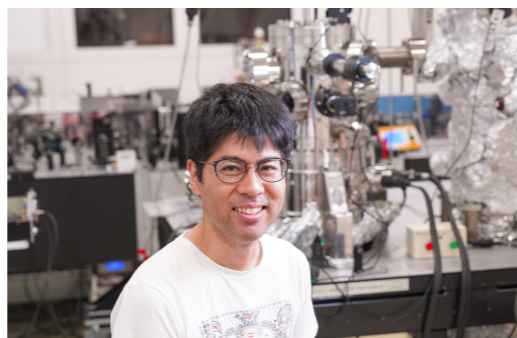
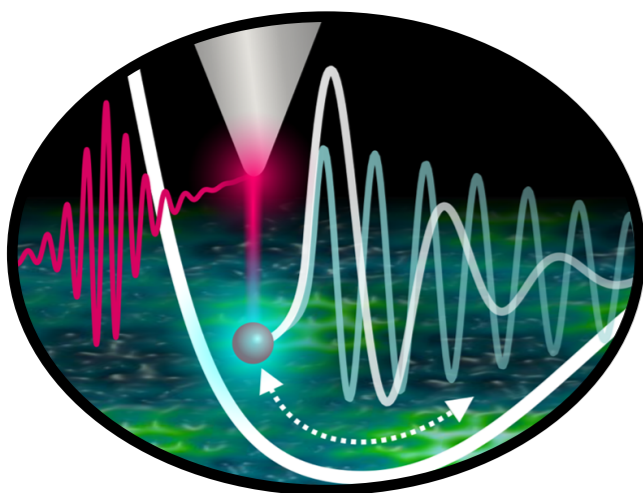
Nanoscale Science Group



National Institutes of Natural Sciences
Institute for Molecular Science
Center for Mesoscopic Sciences

Nano-Spectroscopy

Tool for nanoscience & quantum technology

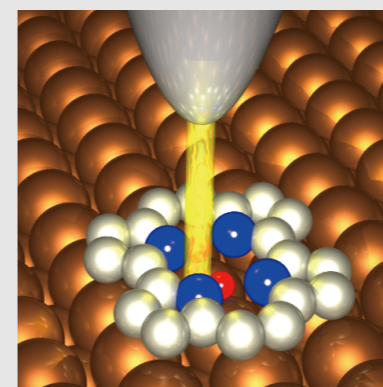


Takashi Kumagai (Group Leader)

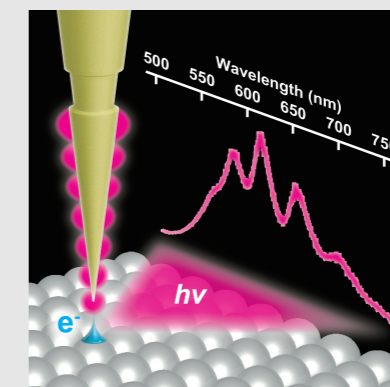
Expert of nanoscale science research using state-of-the-art nano-spectroscopy.

I studied physical chemistry and chemical physics at Kyoto University and further advanced my expertise of nano-spectroscopy techniques at the Fritz Haber Institute in Berlin, Germany. At IMS, our group is dedicated to pioneering research at the forefront of nanoscience and nanotechnology. We eagerly welcome motivated students to join us in tackling the exciting challenges of nanoscale science.

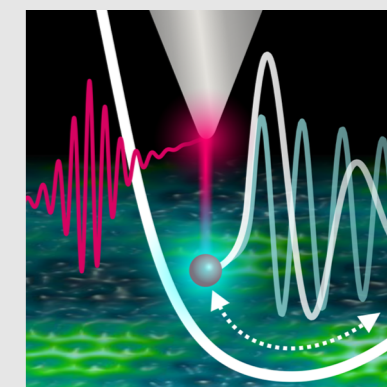
Research at Nanoscale Science Group encompasses a wide range of topics, including near-field optical microscopy and spectroscopy, ultrafast and nonlinear nano-spectroscopy, atomic-scale light-matter interactions, single-molecule science, and nanomaterials science.



Nature Chemistry
8, 935 (2016)



Nano Letters
19, 3597 (2019)



Science Advances
8, eabq5682 (2022)

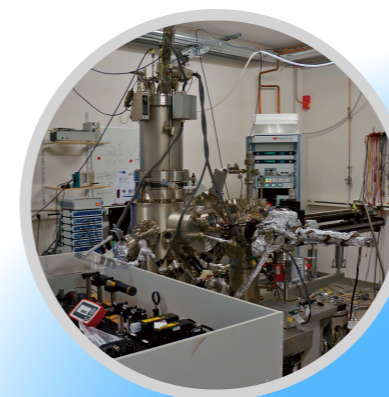
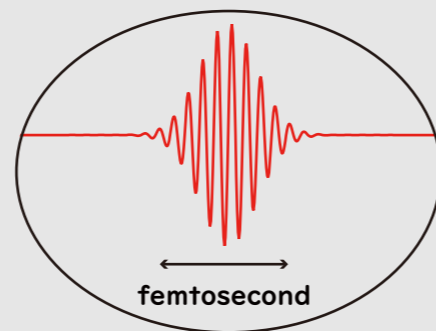
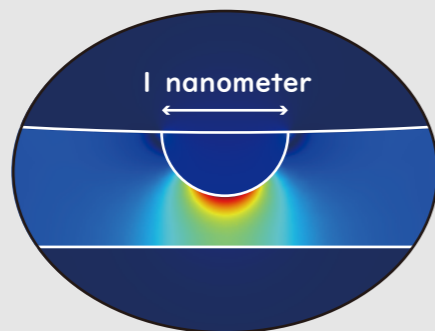
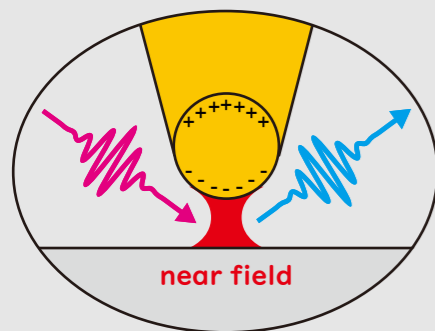
We aim to provide practical learning opportunities in **scanning probe microscopy, laser spectroscopy, near-field optics, theoretical simulations, programming, and instrument development**, fostering the ability to excel as researchers and engineers in the increasingly important fields of nanoscience and nanotechnology.

In the field of nanoscience and nanotechnology, grounded in the principles of quantum mechanics, quantum measurement techniques are essential for directly observing the structure, properties, and functions of matter at atomic and molecular scales. Our research group focuses on developing and applying cutting-edge nano-measurement technologies that integrate optical scanning probe microscopy, near-field optics, and ultrafast spectroscopy.

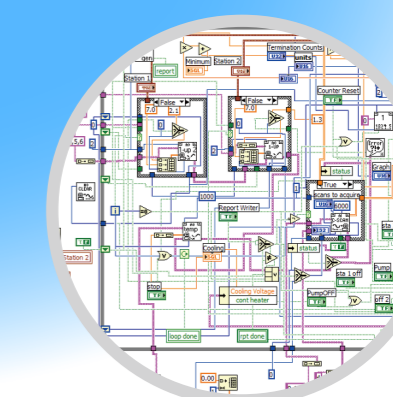
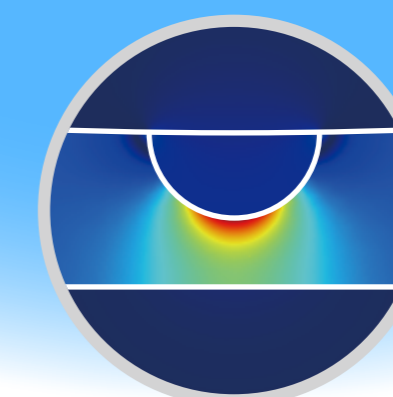
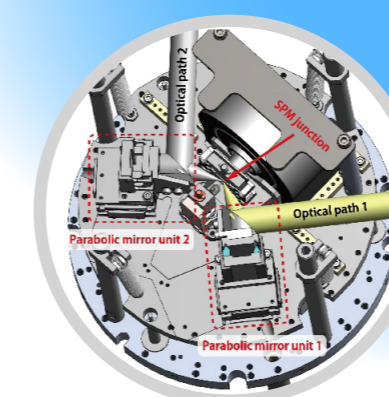
Optical Scanning Probe Microscopy

Near Field Optics

Ultrafast Spectroscopy



To Be Expert of Nanometrology!



We welcome Master's and Ph.D. students with a solid background in physical sciences. Young researchers and faculty members are invited to join us through our internship program. If you are interested, please contact us: kuma@ims.ac.jp

Nano-spectroscopy is a crucial technology in the rapidly advancing field of quantum technology. We welcome applications from students who wish to be expert of nanometrology and lead the next generation of science and technology. If you are interested in, please visit our web site: <https://kumagai.ims.ac.jp/>.