


## Science and Technology in Japan (July 6<sup>th</sup> - July 14<sup>th</sup>, 2023)

### Lecturer Profile, Abstract of Lecture and Field Trip

Optical Manipulation of Atoms and Microparticles	
Date: July 11th	Lecturer: TACHIKAWA Maki
Abstract of Lecture: Motion of atoms and microparticles can be controlled by use of radiation pressure force exerted on the objects. This lecture introduces two types of optical manipulation, laser cooling and trapping, and interesting new physics brought by the techniques. Laser cooling slows down gaseous atoms, lowering their temperature below 1 mK. Ultracold atoms behave differently from classical atoms to exhibit wave nature and a new state of matter. Laser cooling also benefits metrology as a key technique for atomic clocks. Laser trapping, known as optical tweezers, confines atoms and microscopic particles in space. The object is levitated in air or vacuum where the radiation pressure force and gravity balance. Our research projects using laser trapping will be presented.	
Field Trip: Laboratory tour may be arranged after the lecture.	
	TACHIKAWA Maki Professor Department of Physics Research Interests: optical trapping of microparticles, cavity-QED effects in thermal radiation