

【Abstract of 2009 Grant – in – Aid for Scientific Research on Innovative Areas
(Research in a proposed research area)】

Title of project	Extreme quantum world opened up by atoms --towards establishing comprehensive picture of the universe based on particle physics--
Head Investigator Name	SASAO Noboru, Okayama University, Extreme Quantum World, Professor
Abstract of Research Project	The project goal is to create a new field in fundamental physics that combines recent development in atomic physics (quantum electronics) with particle physics (cosmology). In particular, we like to make the first observation of atomic neutrino with a new idea of machro-coherent amplification mechanism and techniques of storing atoms in nano-space. We also like to determine electron and quark electric dipole moments using our innovative methods to deepen our knowledge on CP-violation. Finally, we plan to measure time variation of physics constant with a method of single-ion light clock. Through these studies, we will give clues to remaining mysteries in Universe, such as matter-antimatter asymmetry, dark matter, dark energy etc., and to establish comprehensive picture of Universe based on particle physics.
Term of Project: 2009–2013	