Seminar Invitation

Rydberg-atom quantum simulator

Abstract

Quantum computing has developed, during the last two decades, from a visionary idea to one of the most fascinating areas of modern physics. Numerous unheard-of technical problems involved with the quantum nature of many entangled particles are being challenged. Our research has been focused on Rydberg-atom quantum computation: Rydberg atoms, having a high principal quantum number, are huge in size (typically a few micrometers), a few thousand times bigger than the "usual" atoms in the near-ground state; hence, these atoms can be strongly coupled to each other (entangled), even when they are a few micrometers apart (being optically observable and thus controllable). Our KAIST-Alice machine traps up to N=40 single atoms (rubidium) using so-called tweezer traps (2N number of optical tweezers are rearranged to make a zero-entropy array of N single atoms, using our patented method). These atoms are then excited to a Rydberg energy state to make an entangled N particle system. Currently, we are interested in ways to make, control, and measure this massively-entangled quantum system, to perform intermediate-scale quantum computation (more precisely quantum simulation in the current stage).

- **Speaker:** Prof. Jaewook Ahn (Physics Department, KAIST)
- **Date:** May 28, 2020 (Thursday)
- **Time:** 3:00 pm
- **Venue:** Room C303, Creation Hall (3F), KAIST Munji Campus
- **Contact:** 042) 350-8166 (CAPP Administration Office)
- **Hosted by** ibs 기초과학연구원 Institute for Basic Science, KAIST Department of Physics

Note: Light Refreshments will be provided (다과제공) !!!

Poster Image from NASA/CXC/Caltech/P.Ogle et al; Optical: NASA/STScI; IR: NASA/JPL-Caltech; Radio: NSF/NRAO/VLA