

QUANTUM ATOM OPTICS: FROM OCEANOGRAPHY TO COSMOLOGY

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The experimental platform of atoms manipulated by light offers answers to a broad spectrum of open questions in various scientific areas. A fundamental question in oceanography is the time when deep ocean water was last in exchange with the atmosphere. ^{39}Ar one by one detection allows the dating of water samples as small as ten liters. A very different question is how the early phase of heavy ion collisions at CERN develop in time. Building on our quantum field simulator with rubidium atoms we confirm the theoretical expectation of the development of universal dynamics in isolated quantum systems. In addition, I will touch on our recent result on a quantum field simulator which allows the study of a scalar quantum field of curved space time.

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