This lecture will discuss the current understanding and the latest discoveries regarding cosmology – the science of the universe as a whole – and galaxies and planets. There is overwhelming evidence that most of the density of the universe is invisible dark matter and dark energy, with atomic matter making up only about five percent of cosmic density. UCSC cosmologists helped to create the standard modern cosmological theory — but the latest high-precision measurements have revealed potential discrepancies that may require new physics. Galaxies were long thought to start as disks of gas and stars, but observations by Hubble Space Telescope show that most galaxies instead start pickle shaped. More massive galaxies have massive black holes at their centers, and matter falling onto these black holes causes outflows of energy that can strongly affect their host galaxies. Information about planetary systems is growing rapidly with new observations, and our own solar system seems increasingly to be unusual.

JOEL PRIMACK
Distinguished Professor Emeritus, Physics at UC Santa Cruz
Dr. Joel R. Primack specializes in the formation and evolution of galaxies and the nature of the dark matter that makes up most of the matter in the universe. After helping to create what is now called the “Standard Model” of particle physics, Primack began working in cosmology in the late 1970s, and he became a leader in the new field of particle astrophysics. His 1982 paper with Heinz Pagels was the first to propose that a natural candidate for the dark matter is the lightest supersymmetric particle. He is one of the principal originators and developers of the theory of Cold Dark Matter, which has become the basis for the standard modern picture of structure formation in the universe. With support from the National Science Foundation, NASA, and the Department of Energy, he has been using supercomputers to simulate and visualize the evolution of the universe and the formation of galaxies under various assumptions.

MONTED BY BARRY BOWMAN, PRESIDENT, UCSC EMERITI ASSOCIATION

NOVEMBER 10, 7 P.M.

QUESTIONS? PLEASE CONTACT
SPECIALEVENTS@UCSC.EDU

VIRTUAL ON ZOOM
FREE AND OPEN TO THE PUBLIC
VISIT EVENTS.UCSC.EDU TO REGISTER