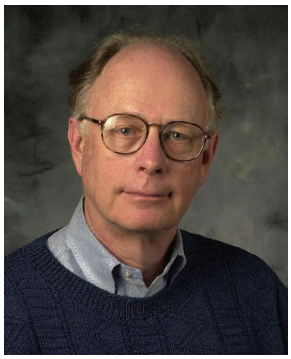
Joint Physics/PCTS Colloquium

"The Quantum Origin of Our Classical Universe"

Speaker:
James Hartle
University of California
Santa Barbara



A striking feature of our indeterministic quantum universe is the wide range of time, place, and scale on which the deterministic laws of classical physics hold. This talk will describe the origin of this quasiclassical realm in a quantum cosmology based on Hawking's no-boundary quantum state of the universe. Classical spacetime is the key to the quasiclassical realm, and the no-boundary probabilities for different classical spacetimes lead to different predictions for cosmological observations today. In a simple model, these probabilities favor a long period of inflation, small fluctuations such as those seen in the CMB, but significant fluctuations away from homogeneity on very large scales. Probabilities will also be discussed for properties of the early universe such as whether it was singular or bounced at a small radius, and the direction of the arrow of time.

PRINCETON
CENTER FOR
THEORETICAL
SCIENCE

December 4, 2008
Jadwin Hall
A-10 4:30 pm

Host:PCTS
Tea in 218 Jadwin Hall at 4 p.m.

Princeton University Department of Physics Colloquium