

Quantum mechanics is the fundamental framework for the physics of the very small. It is usually formulated for laboratory measurements carried out by observers. But in the early universe there were no observers. Are we to believe that quantum theory doesn't apply there? No. In the very early universe large and small are one. At the big bang the biggest possible system has the smallest possible size. It is obviously quantum mechanical. How then can quantum mechanics be formulated so it works at the big bang? The **decoherent histories quantum theory** [that Gell-Mann and Hartle proposed] was an important step in that direction. Understanding quantum mechanics for the universe helps understand quantum mechanics for the laboratory.

-Jim Hartle