

2019 DISTINGUISHED LECTURE SERIES

Free and open to the public



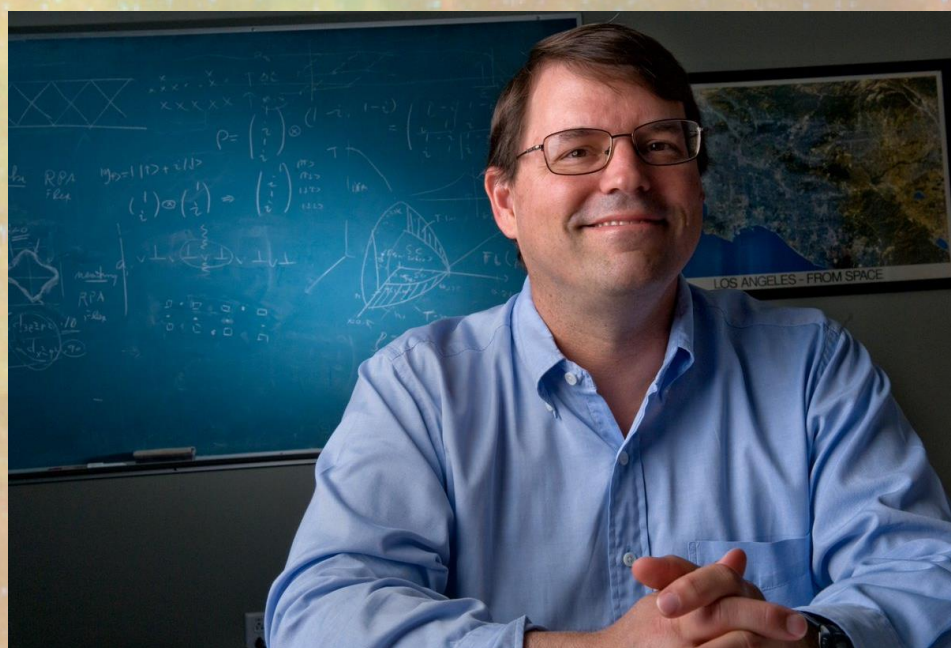
Taming the Exponential: Adventures in Chaos and Quantum Mechanics

Steven White, UC Irvine

July 24, 2019, ARC Ballroom UC Davis, 1-2pm

Many of the hardest problems in science have complexity that grows exponentially, including chaos and quantum mechanics. This exponential complexity seems to make solving these problems inconceivably challenging. For example, it is essentially impossible to predict if it will rain on a particular day a month from now. Nevertheless, scientists have figured out how to cleverly beat the exponential for many important problems, allowing us to understand climate change and design new molecules. This lecture will explain what exponential complexity is and how to tame it, with examples from chaos and quantum mechanics.

Steven R. White is the inventor of the density matrix renormalization group (DMRG), one of the most successful algorithms known for solving quantum mechanics. White has applied DMRG to problems in condensed matter physics, such as understanding high-temperature superconductivity and quantum spin liquids. A native Californian, White grew up in Yuba City and Redding, and earned his BA at UC San Diego, triple majoring in Physics, Math, and Economics. He earned his Ph.D. at Cornell, working with Nobel Laureate Ken Wilson. White is a member of the National Academy of Sciences, the American Academy of Arts and Sciences, and has won the Rahman Prize of the American Physical Society and the Feenberg Memorial Medal for Many-Body Physics.



cosmos@ucdavis.edu