

Benjamin Wandelt

University of Illinois at
Urbana-Champaign



Cosmic Past, Present, Future: Planck and Beyond

Department of Physics Colloquium



WISCONSIN

How can we learn what banged at the Big Bang? We use astronomical observations to probe the epoch in the very early Universe where quantum fluctuations imprinted the seeds of cosmic structure. I will summarize the main results of the analysis of the cosmic microwave background temperature anisotropies as seen by the Planck mission data released in March 2013, with special emphasis on the non-Gaussianity analysis which resulted in the highest precision tests to date of physical mechanisms for the origin of cosmic structure. Then I will turn to the future and highlight the challenges and opportunities of the next generation of probes of the large scale structure of the universe aiming to piece together the outstanding puzzles of cosmic past, present, and future - with some glimpses onto the lab bench of innovative approaches that are now emerging.