

**TALK TITLE:** Studying Dark Energy, Black Holes and Cosmic Feedback at X-ray Wavelengths: NASA's Constellation-X Mission

**ABSTRACT:**

Among the most important topics in modern astrophysics are the nature of the dark energy equation of state, the formation and evolution of supermassive black holes in concert with galaxy bulges, and the self-regulating symmetry imposed by both stellar and AGN feedback. All of these topics are readily addressed with observations at X-ray wavelengths. For instance, theoretical models predict that the majority (98%) of the energy and metal content in starburst superwinds exists in the hot million-degree gas. The Constellation-X observatory is being developed to perform spatially resolved high-resolution X-ray spectroscopy so that we may directly measure the absolute element abundances and velocities of this hot gas. This talk focuses on the driving science behind this mission, which is one of two flagship missions in NASA's Beyond Einstein program. A general overview of the observatory's capabilities and basic technology will also be given.