

Title: "Why I compute"

Abstract: I will discuss the issues faced when using modern massively-parallel computers to simulate astrophysical phenomena. The nondimensional numbers characterizing most astrophysical phenomena are sufficiently large that direct numerical simulations – meaning simulations that accurately portray fundamental physical properties such as viscosity and electrical conductivity - describing these phenomena are not just difficult - they are most likely even in principle impossible. Despite this inconvenient fact, modern astrophysics clearly revels in modeling astrophysical phenomena – and the skeptical observer might well ask, "To what effect?" I will discuss my answer to this question.