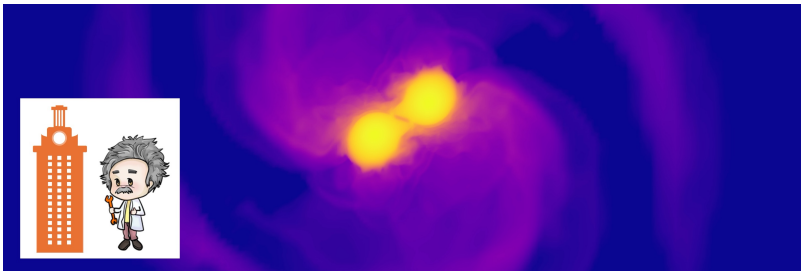

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EmitCactus: Generating CarpetX Thorns From a Python-Based DSL & CottonmouthBSSN: A New, Fast CarpetX BSSN Code

Tuesday 10 June 2025 14:00 (1 hour)

In this talk, we will introduce EmitCactus, a development environment which provides users with the capability of generating complete, performant, GPU-ready CarpetX thorns from a high-level, symbolic Python-based DSL. We will discuss the modular design of EmitCactus which allows for the development of custom frontends (e.g., NRPy LaTeX) and backends (e.g., drivers besides CarpetX). We will also introduce CottonmouthBSSN, a new CarpetX BSSN code created from scratch in EmitCactus, comparing its results and performance against CanudaX, a handwritten CarpetX port of the well established Canuda BSSN code. We demonstrate that Cottonmouth is capable of producing comparable results at higher performance with much lower implementation complexity.

Presenters: TIMOTHEO SANCHES, Lucas (Louisiana State University); MORRIS, Max (Louisiana State University)