

# cuHARM: general relativistic radiation magneto-hydrodynamics in the era of exascale computing

*Monday, 5 May 2025 11:45 (15 minutes)*

I will present cuHARM, a general relativistic radiation magnetohydrodynamic solver optimized to exploit exascale computing facilities. After describing the core numerical strategy for multi-node and multi-GPU setups, I will detail how radiation and its feedback on the dynamics are modeled. In cuHARM, the specific intensity is discretized in space and momentum, and is evolved through the solution of the radiative transfer equation via the discrete ordinate method. This approach does not require the use of a closure relation and allows to resolve in details the anisotropy of the specific intensity. I will then present the performance of the numerical approach on known radiative test problems as well as our first results of radiative accretion at 0.1 Eddington luminosity.

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**Session Classification:** Monday morning

**Track Classification:** Numerical simulations