Hi all,

Here's what you folks might find interesting today. It's a relatively quiet day for your specific interests, but a couple of papers stand out.

Agentic AI and Workflow Automation

LQCDMaster: Agentic Scientific Computing for Lattice Quantum Chromodynamics Research by Haofei Gao et al. This might be interesting for you, Jingjing. The paper presents a tool-augmented, domain-specialized scientific computing agent that converts natural-language lattice QCD research tasks into executable PyQUDA workflows, including measurement scripts, job-submission artifacts, and numerical outputs. The system combines agentic planning with expert-annotated LQCD skills and a deterministic Wick-contraction tool to constrain the algebraically fragile parts of code generation, achieving exact reproduction of expert-written implementations in 63 of 70 benchmark tasks. This directly speaks to your interest in **Agentic AI and workflow automation for particle physics analysis tasks** -- it demonstrates a concrete paradigm where an LLM-based agent handles end-to-end scientific computing workflows, from task specification through code generation to numerical validation, reducing implementation time from hours to minutes. While the domain is lattice QCD rather than collider physics, the architectural choices (skill-guided planning, deterministic tools for fragile components, end-to-end validation) are directly transferable to automating MC sample generation or analysis code writing in collider contexts.

Simulation-Based Inference

Cosmic string gravitational wave backgrounds at LISA: II. Reconstruction of conventional signals over astrophysical foregrounds by Androniki Dimitriou, Daniel G. Figueroa, Peera Simakachorn, Isak Stomberg, Bryan Zaldivar. This is interesting for you, Jingjing. The paper uses the **simulation-based inference** package GWBackFinder to perform joint inference on LISA noise, astrophysical foregrounds, and cosmic-string signals across a range of injected string tensions. The key finding is that including all major astrophysical foregrounds (SOBHBs, WDs, EMRIs, MBHBs) degrades the reconstruction capability by factors of 10^5 relative to foreground-free estimates, requiring G*mu >= 10^-11 for 10% precision. This is a clean demonstration of SBI applied to a challenging multi-component inference problem in fundamental physics, where the likelihood is intractable due to complex foreground modeling -- directly relevant to your interest in likelihood-free inference applied to fundamental sciences.

Unfortunately, nothing in today's batch touches on anomaly detection, jet tagging, jet substructure ML, hypergraph networks, or Lorentz-equivariant architectures -- so Aritra, there's not much to flag for you today. Back tomorrow with more!

P.S. In the most recent submission window: hep-ph: 30 papers hep-ex: 12 papers hep-th: 34 papers