

# DIS2023: XXX International Workshop on Deep-Inelastic Scattering and Related Subjects



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Type: **Parallel talk**

## Reconstructing Information in Deeply Virtual Exclusive Processes

*Tuesday 28 March 2023 14:40 (20 minutes)*

Deeply virtual exclusive reactions encode the dynamics of bound partons in hadrons through 3D quantum mechanical correlation functions - the generalized parton distributions; however, there are many levels of abstraction in the analysis from experimental data to information on hadron structure. There is an immediate need to develop advanced phenomenology and computational tools in preparation for the comprehensive exclusive reaction program planned for the upcoming EIC. The FemtoNet framework was developed to answer this call by reframing the analysis of exclusive experiments as a quantification of information loss and reconstruction through the many inverse problems encountered. FemtoNet utilizes physics-informed deep learning models whose architectures are specifically designed to inherently satisfy physics constraints in their predictions. The FemtoNet framework also leverages a suite of uncertainty quantification techniques to separate reducible and irreducible errors from the analysis and properly propagate experimental uncertainty. I will demonstrate what physics-informed deep neural networks are capable of in the context of reconstructing lost information from inverse problems in exclusive scattering experiments and give prospects for the future of such a program and consequences for an EIC.

### Submitted on behalf of a Collaboration?

No

### Participate in poster competition?

No

**Primary author:** KRIESTEN, Brandon

**Co-authors:** ALMAEEN, Manal (Old Dominion University); LIUTI, Simonetta (University of Virginia); LI, Yaohang (Old Dominion University); LIN, Huey-Wen

**Presenter:** KRIESTEN, Brandon

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