

## From Mathematical Sense-Making in Physics to Creating Sustainable Models for Transforming Teaching Evaluation: The Promises of Learning Sciences and Educational Research

**Monday, October 17, 2022 // 2:00 – 4:00 PM**

**Curtis Hall Multipurpose Room**

**Refreshments Provided**



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In recent decades significant attention has been paid to how students use mathematical tools in making sense of physics. I present a categorical framework (Gifford and Finkelstein 2020 & 2021) that helps us link among prior models of mathematical sense-making in physics. Applying this framework to case studies and larger scale analysis of student work in a middle-division modern physics course, we demonstrate its utility both to describe student reasoning moves, and to analyze and potentially design curricula to foster particular functional use of mathematical sense-making in physics. While productive, I argue that such approaches alone are insufficient for scalable sustainable change in undergraduate education; we must build models of institutional change and uptake of these approaches. I present a preliminary model of institutional change focusing on the department as the sustainable and scalable unit of transformation in higher education. This model of change, the Departmental Action Team model, is applied to an effort that takes more scholarly approaches to teaching evaluation. I share how this approach has scaled across the majority of departments on the University of Colorado Boulder campus, and aligns with and is supporting a national movement.