

## Abstract Information

- **Title:** Intuitive and Rule-based Reasoning in the Context of Calorimetry\*
- Meeting:** 128th AAPT National Meeting: Miami Beach, FL
- Location:** Le Jardin
- Date:** Monday, Jan. 26
- Time:** 6:45 p.m.
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- Abstract:** As part of a project to investigate and address learning difficulties in thermal physics, we have explored student approaches to solving calorimetry problems involving two substances with differing specific heats. We have found that students often employ various context-dependent rules-of-thumb such as "equal energy transfer implies equal temperature change," and "temperature changes are directly proportional to specific heat." We will present interview data that sheds additional light on how students' reasoning often leads to this rule-based problem-solving pattern. We find that students frequently get confused by, or tend to overlook, the detailed proportional reasoning or algebraic procedures that could lead to correct solutions. Instead, they often proceed with semi-intuitive reasoning that may or may not be productive. Preliminary efforts to address these and related problems with tutorial-style worksheets has yielded some promising results, but a substantial degree of student confusion persists even after special instruction.
- Footnotes:** \*Supported in part by NSF grant #DUE-9981140.