



Contribution ID: 1895

Type: **Invited Speaker / Conférencier invité**

## Teaching Critical Thinking in a First Year Physics Lab

*Wednesday, 31 May 2017 15:45 (30 minutes)*

In a multi-year study at the University of British Columbia, first year physics labs are used primarily to teach students about the tools used to analyze and interpret data. Within this context, we have developed a simple form of scaffolding that dramatically enhances the quality of student reasoning. Students are asked to make comparisons after completing some measurements, to reflect on the comparison, make a plan based on their reflection, then execute the new plan. The experiments are simple enough that they can do this cycle more than once, modeling a more authentic, iterative approach to experimentation. We find that after several weeks, when the scaffolding has been removed, students continue with this more expert-like behavior and show improvements in the quality of their reasoning. Further refinements to this approach indicate that students benefit from an opportunity to do an experiment, without being taught any analysis techniques, allowing them to more freely explore the tools that they have learned.

**Primary author:** Prof. BONN, Doug (University of British Columbia, Department of Physics & Astronomy)

**Presenter:** Prof. BONN, Doug (University of British Columbia, Department of Physics & Astronomy)

**Session Classification:** W4-6 Lab Revitalization (DPE) | Revitalisation de laboratoires (DEP)

**Track Classification:** Physics Education / Enseignement de la physique (DPE-DEP)