

Getting Your Head in the Clouds: Construction of a Small Cloud Chamber

Monday 15 August 2022 12:14 (12 minutes)

Lecture demonstrations are an essential part of physics education, allowing students to foster a more intuitive and meaningful grasp of key scientific concepts. As particle detectors, cloud chambers have the unique property of allowing for real-time, naked-eye visualization of ionizing radiation through the production of a condensate trail in a super-saturated alcohol atmosphere. For this reason, the cloud chamber is an excellent learning aid in entry-level physics courses and outreach purposes, capturing students' attention and imagination. The goal of the project is to construct an inexpensive, standalone cloud chamber using off-the-shelf parts and easily available tools. To accomplish this, a two-stage thermoelectric cell was used to cool the chamber, housed within a 3D printed frame. The device is portable and powered by a computer power supply. This presentation will detail the construction and design of the chamber and outline the learning goals for the chamber as an outreach tool. A complete and open-source build guide will be available for individuals seeking to construct one of their own.

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Session Classification: Session II