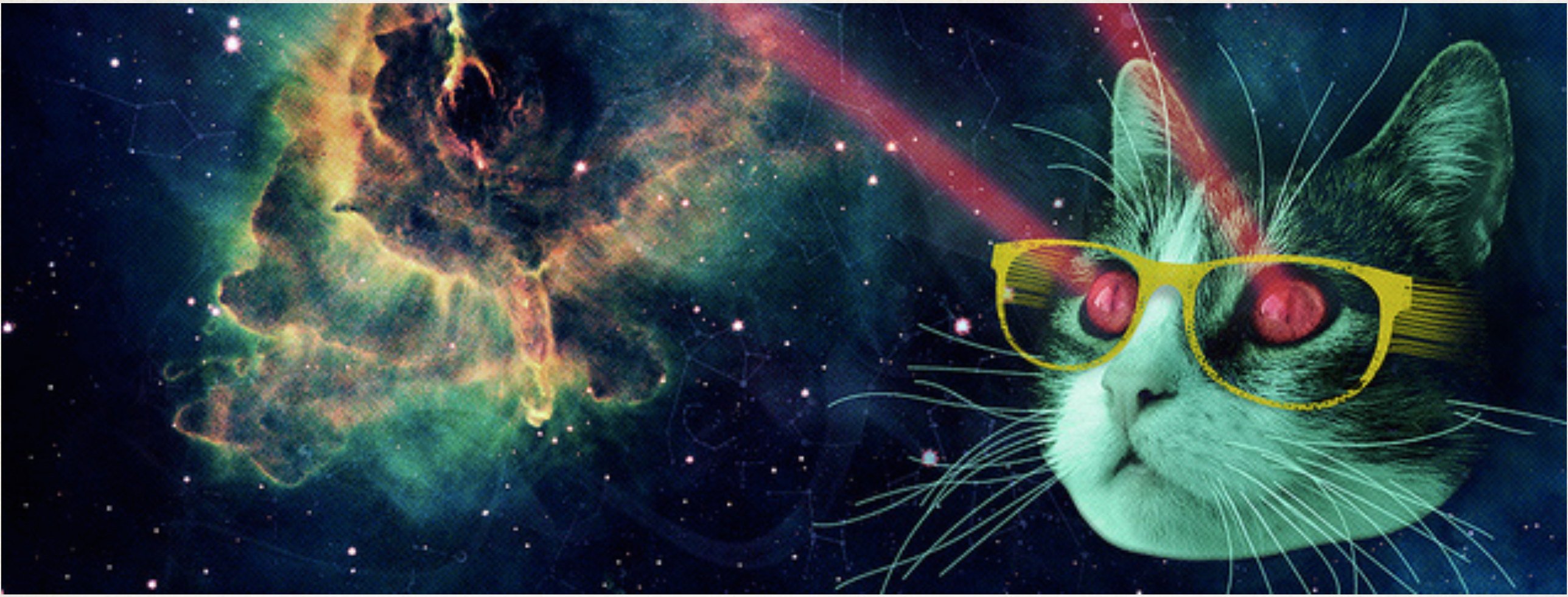


Laser fluorescence spectroscopy of C_2^- for the Borealis project (AEgIS)

Presentation I

Lauren Weiss

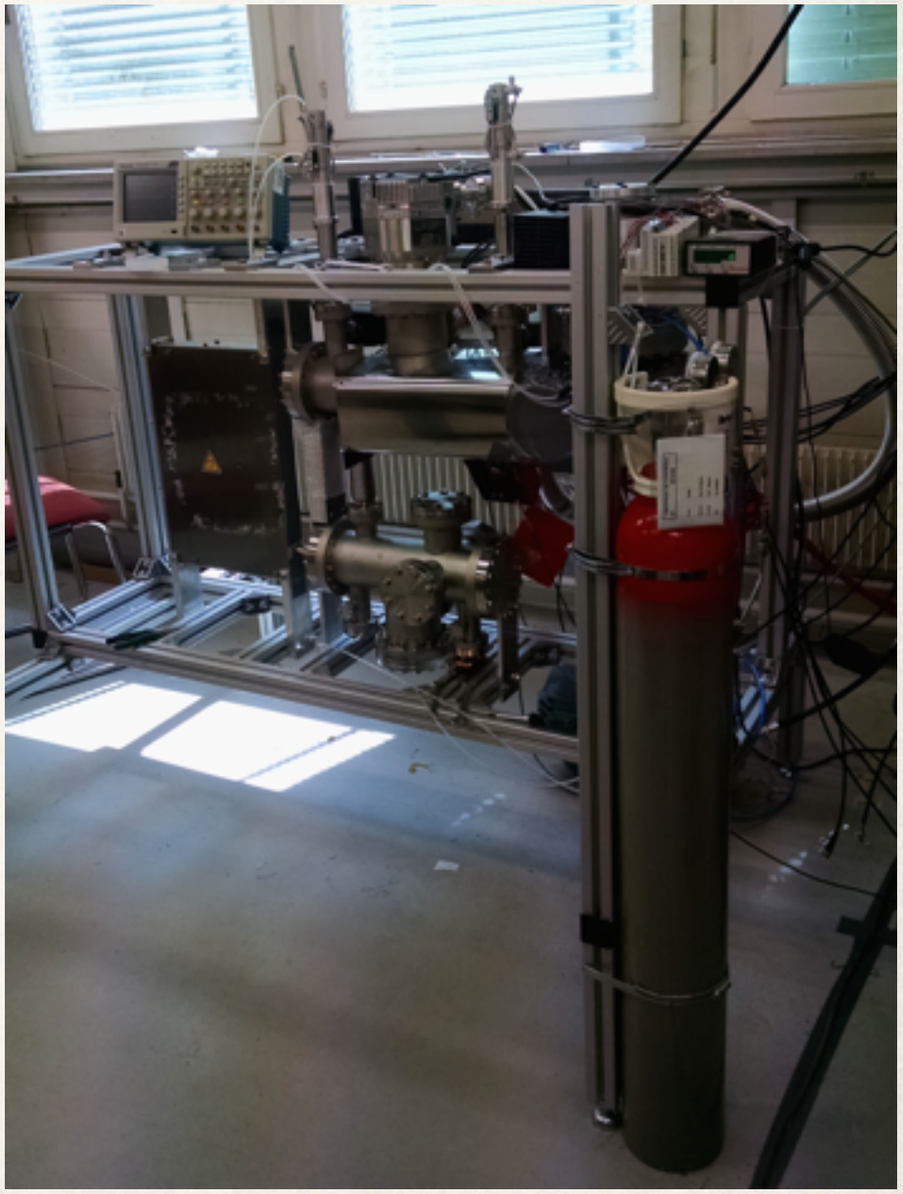
June 30, 2017

AEgIS: The Big Picture

- Antihydrogen Experiment: Gravity, Interferometry, Spectroscopy (AEgIS)
- Goal: Measure g on anti-hydrogen (test Weak Equivalence Principle)
- Form positronium (e- with an e+) then react with cold, trapped antiprotons to form anti-hydrogen
- Send anti-hydrogen beam through interferometer and measure its vertical displacement

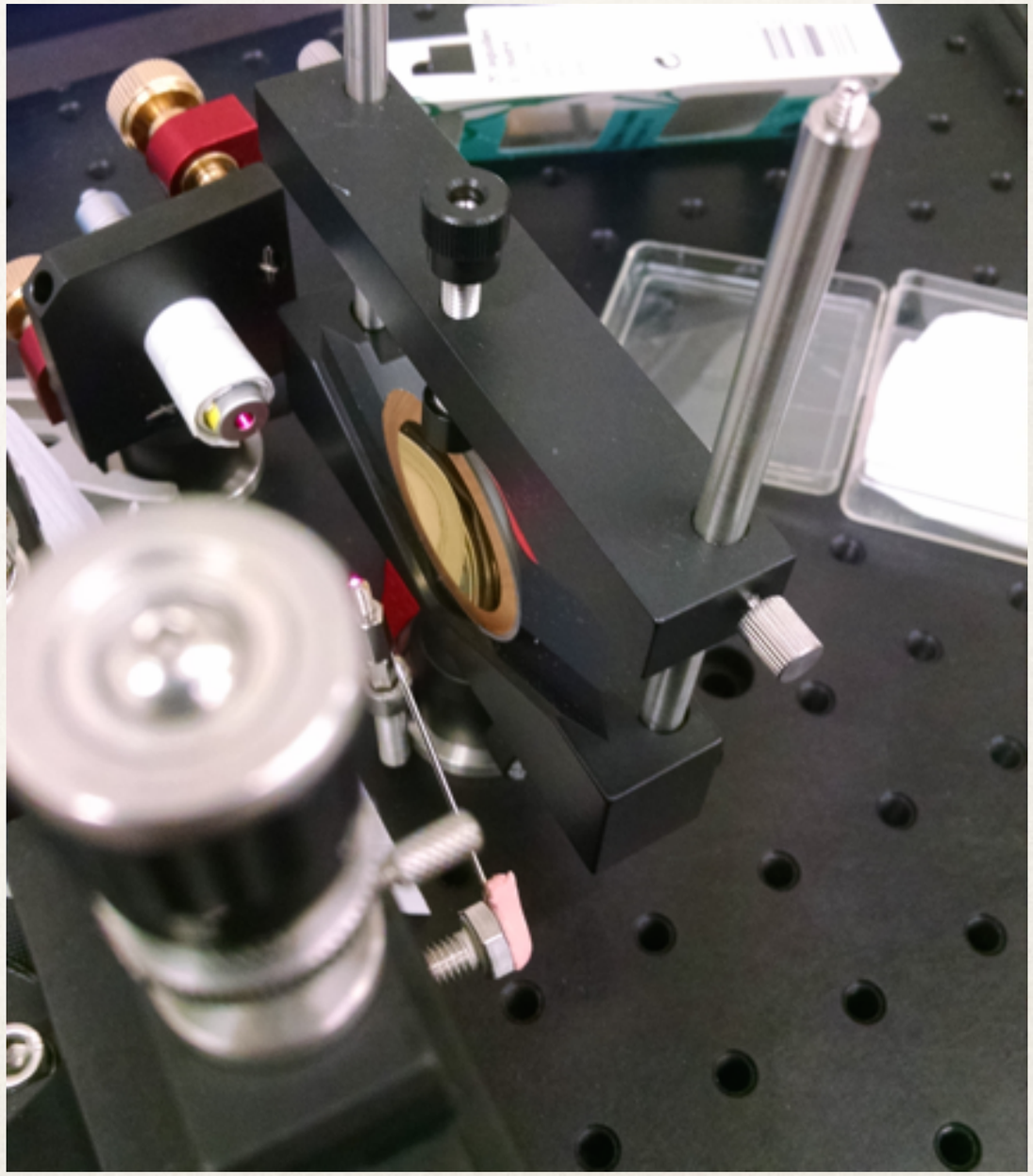
COLD antiprotons: Borealis

- Molecular anions have never been laser-cooled before
- C_2^- as candidate for sympathetic cooling of antiprotons
- Borealis project goal: cool C_2^-
- Must characterize beam of C_2^- using laser fluorescence spectroscopy



My setup

- Testing optics for laser fluorescence spectroscopy
- Laser pointer, needle as 4 pi light source
- Beautiful gold mirror



What's next for me?

- Learn AutoCAD
- Design laser / fiber holder, mirror holder
- Use setup to characterize C_2^- beam (hopefully)
- Thank you!