Welcome to the ACFI!

LIGO

ATLAS

EXO

Theory
Our mission:

Advancing research in theoretical and experimental physics at the interface of the Energy, Intensity, and Cosmic frontiers.

http://www.physics.umass.edu/acfi/

We seek answers to key open questions about nature’s fundamental interactions, such as:

- Why is there more matter than anti-matter in the Universe?
- What additional forces were active during the first moments after the Big Bang?
- How are protons and neutrons put together?
Activities

- **Core Research (in house):** ATLAS, EXO, J Lab parity & chiral, RHIC Spin, Borexino, Theory

- **Targeted Workshops:** Hadronic Probes, Lambda & Quasi Lambda, Higgs Portal,…

- **Visiting Researchers:** Ph.D. students (Australia, China), post-docs, faculty & senior researchers
Past Workshops

Hadronic Probes of Fundamental Symmetries

*Joint ACFI-Jefferson Lab Workshop*

March 6-8, 2014
U Mass Amherst
Past Workshops

Lambda and Quasi-Lambda

ACFI Workshop

April 10-12, 2014
U Mass Amherst
Past Workshops

Unlocking the Higgs Portal

ACFI Workshop

May 1-3, 2014
U Mass Amherst
Past Workshops

Measuring the Neutron Lifetime

*ACFI Workshop*

September 19-21, 2014
U Mass Amherst
Past Workshops

Fundamental Symmetry Tests with Rare Isotopes

*Joint ACFI-FRIB Workshop*

October 23-25, 2014
U Mass Amherst
Past Workshops

Time-Reversal Tests in Nuclear and Hadronic Processes

ACFI Workshop

November 6-8, 2014
U Mass Amherst
Past Workshops

Hadronic Matrix Elements for Probes of CP Violation

ACFI Workshop

January 22-24, 2015

U Mass Amherst
Past Workshops

International Workshop on Baryon & Lepton Number Violation

ACFI Workshop/Conference

April 26-30, 2015
U Mass Amherst
Past Workshops

CP Nature of the Higgs Boson

ACFI Workshop

May 7-9, 2015
U Mass Amherst
Past Workshops

Probing the Electroweak Phase Transition with a Next Generation PP Collider

ACFI Workshop

September 17-19, 2015
U Mass Amherst
Upcoming Workshops

LHC Searches for Long-Lived BSM Particles: Theory Meets Experiment

ACFI Workshop

November 12-14, 2015
U Mass Amherst
Upcoming Workshops

**Neutrino Mass: From the Terrestrial Laboratory to the Cosmos**

*ACFI Workshop*

December 14-16, 2015
U Mass Amherst
Meeting Logistics

- **Wireless Network**: UMASS (usr & pw in packet)
- **Lunch**: on campus
- **Workshop Dinner**: Thurs @ Johnny’s Tavern, 6:30 pm
  - Saturday: on own in Amherst Ctr
- **Schedule**: online
- **People**: students, post-docs, staff
- **Espresso**!
Workshop Scientific Goals & Questions

• Develop a coherent strategy for long-lived particle searches that would cover all the important scenarios

• Identify a set of simplified models based on theoretical input in order to guide the searches in the 13TeV LHC run, to either discover or exclude the existence of such particles

• Establish a clear formalism for presenting the experimental results of long-lived searches such that future re-interpretation is possible and straightforward

• Write a document providing a framework long lived object searches and their theoretical interpretation