From: **Michael Jones** mdj@phys.hawaii.edu
Subject: Cosmic Ray Day for teachers and students
Date: August 31, 2018 at 1:56 PM
To: aapthawaii-l@lists.hawaii.edu

MJ

Cosmic Ray Day at Punahou on 29 Sept. 2018

Below is the schedule for the next Cosmic Ray Day. This year students will analyze data from the AMS experiment on the International Space Station as well as data from QuarkNet muon detectors on land.
Please let us know as soon as possible whether you will attend and the names of students who will attend. We need a count for several reasons including lunch. Send names to mkadooka@gmail.com.
To make the day as productive as possible, please have students review either the Cosmic Extremes or What are Cosmic Rays booklets. Links to them are given at the bottom of the schedule below. The flyer and other are resources at
http://www.phys.hawaii.edu/ams02/outreachnsf/index.html
https://www.phys.hawaii.edu/ams02/outreachnsf/activities.html

Cosmic Ray Day
Punahou H.S., Mamiya Science Center
29 Sept. 2018
A map of the Punahou campus can be found at
http://www.punahou.edu

0830 - 1500

0830-0900 registration & pretest : M. Kadooka, C. Kobashigawa

0900-0930 Veronica Bindi (from NASA in Washington, DC)
Intro. and welcome

0930-1000 C. Light : AMS data

1000-1115 solar energetic particles activity
middle school : C. Kobashigawa
high school : D. Ong, C. Light

1115-1145 S. Wang : particle detector demo

1145-1200 T. Coke/J. Adams : tour of Punahou cosmic ray detector

1200-1245 lunch with physicists

1245 A. Popkow : group photo

1300-1430 particle detector activity
middle school : C. Kobashigawa, C. Light
cosmic ray analysis using e-Lab (www.phys.hawaii.edu/~quarknet)
high school : M. Jones, P. Grach

1430-1500 post test and evaluation : C. Kobashigawa

Preparation: BRING LAPTOPS IF POSSIBLE.
Before coming to the workshop, students should be familiar with some basics about cosmic rays and muons. A good source is the Cosmic Extremes booklet available at the e-Lab Library/Resources links from the Student page at
https://www.i2u2.org/elab/cosmic/content/CosmicExtremes.pdf
Another is the booklet What are Cosmic Rays by Hayanon available at
www.stelab.nagoya-u.ac.jp/ste-www1/pub/nanda/cosmicrays_e.pdf
In particular, students should be able to answer the following:
What are muons?
Where do muons come from?
How are muons detected?