IceCube MasterClass
AN AUTHENTIC ASTROPHYSICS RESEARCH EXPERIENCE

Icebreaker Activity

Building the history of neutrino astronomy

What we need

A set of paper/magnet strips, each with one fact from the history of neutrino astronomy. Alternatively, each strip could also have a hint printed on the other side.

A board with as many rows as facts, or alternatively with a set of years already prepared.

List of resources provided

History of neutrino astronomy ready to be printed and with marks for strip cuts. This document can be printed either with only odd pages or with both sides and including hints on even pages.

Activity proposal

When students arrive at the masterclass host institution, they will be given one or more paper/magnet strips, each containing a description of a milestone in the history of neutrino astronomy.

Students will be requested to build up this history, from the discovery of cosmic rays to the detection of astrophysical neutrinos in IceCube.

The following format proposals could be used to adapt to time availability and prior knowledge of the students.

This activity could last from 10 to 20 or more minutes, depending on the format.

- We could provide a timeline of years, without text, to the students to help them in recreating the history of neutrino astronomy. Otherwise, students could try to sort milestones by guessing the order of events and tutors could reveal dates at the end.

- We could give some hints to the students to complete the timeline.
  - A few milestones could already be placed on the timeline showing when some of the new ideas/experiments happened.
  - Each milestone strip could contain a hint on the other side of the paper/magnet, which relates it to others in the timeline.

i. Build the timeline of the neutrino history.
Tutors will ask students to work collaboratively to build the history of neutrino astronomy using the information they have. This has to be a "race against the clock" kind of activity. We do not want them to start long discussions about each possibility, but to try to guess what could have happened first and what must have happened later, based on prerequisite knowledge/activity, etc. Time guide: 5 to 10 minutes.

ii. Correct the timeline and discuss how research advances
Tutors will go through the students' proposed timelines, correcting those milestones that were not in the proper place (years will be added, if not there before). At this point, we'd like students to indicate what they find to be most relevant/surprising in this history. We want them to think about the interaction between theory and experiment, along with the difference in pace between ideas/experiments, failures, failures that were just a first step towards a success, etc. Final thoughts will be shared on the history of IceCube: when it all started, how long it took to go from an idea to a concept, and the main challenges along the way.