Introduction to Tutorials

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July 6, 2009
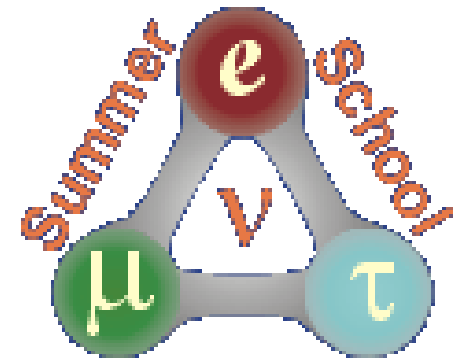
Tutorial Schedule

date	Tue 7 July	Wed 8 July	Thu 9 July	Thu 9 July	Mon 13 July	Wed 15 July	Wed 15 July	Thu 16 July
time (PM)	5:15-6:30	5:15-6:30	3:30-4:45	5:15-6:30	5:15-6:30	3:30-4:45	5:15-6:30	3:30-6:30

Overall Game Plan

- Today: you break up into groups of 4 or 5 (at the end of today's session)
- You will receive a set of 24 questions, and you are assigned 3 of those questions
- Your group must pick one of those 3 questions, and spend the next 2 weeks coming up with an answer.
- Tutorial sessions at Pheasant Run will be staffed by lecturers and organizers so you will have help
- Final "Tutorial" consists of your group presenting the answer to your question in a 15 minute presentation
  - July 16, 3:30-5:30
- Valuable prizes will be given to those groups who have the best presentation (there are several categories)

Questions for Tutorials

- Questions have come from both the lecturers and the organizers

- They are open-ended, there is not necessarily one right answer

- They may not be answerable in their current form, but the document on the web associated with the tutorials will be updated as you provide feedback on the questions

Examples of Questions

- ICE Cube reconstructs one event that looks like a 200 TeV double bang event. Come up with a strategy for proving to yourself and the community that it is real.

- A terrorist organization is developing nuclear weapons in secret. Assuming the location of their lab is known, work out parameters for a neutrino monitor of your design that would be able to pick up nuclear tests or production of fuel at a nuclear reactor, under the condition that you know where their lab is.

- The KATRIN neutrino mass experiment and follow-ups measure null results while results from Planck and other observations yield a positive measurement in the mass range supposedly ruled out by the direct measurements. How would you explain this discrepancy? What alterations in cosmology are implied by the discrepancy? Don't be afraid to discard any standard assumptions about cosmology, neutrino properties, reliability of experimental methods, etc., as long as you are not violating observable results known today.

Advice

- Read through your 3 questions and pick the one you think will be the most fun

- If you finish your question (and presentation) early, you're welcome to work on another question, but you must at least present one of your "select three" to make sure the most questions are presented at the end of the school.

- Every group is allotted 15 minutes of fame at final session: we'll break up into 2 presentation rooms.
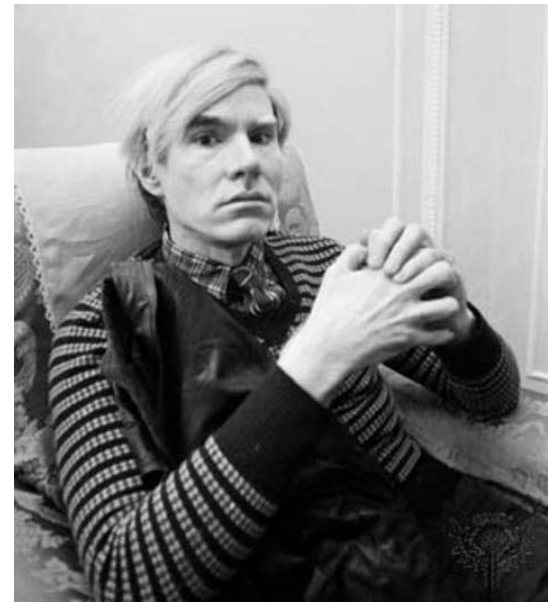
Special Tutorial Packages

- Patrick Huber is here this week to help students download and work with GLOBES software

  - GLoBES (General Long Baseline Experiment Simulator) is a flexible software package to simulate neutrino oscillation long baseline and reactor experiments.

- Mark Messier is here this week to help students download and work with NEUGEN3 and root software

  - Simulates neutrino interactions and you can program in a detector response of your chosing
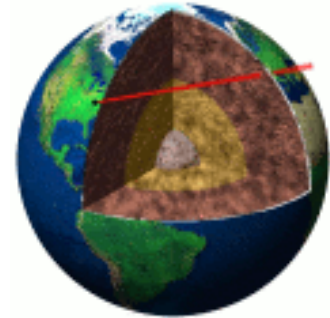
Assignments (also on handout)

Group	Choice of Questions	Group	Choice of Questions
A	1,9,17	L	4,12,20
B	2,10,18	M	5,13,21
C	3,11,19	N	6,14,22
D	4,12,20	O	7,15,23
E	5,13,21	P	8,16,24
F	6,14,22	Q	1,9,17
G	7,15,23	R	2,10,18
H	8,16,24	S	3,11,19
I	1,9,17	T	4,12,20
J	2,10,18	U	5,13,21
K	3,11,19	V	6,14,22

Have Fun!