New York Schools Cosmic Particle Telescope

Summer School, August 9-23, New York University

All lectures and labs will be held in

Meyer Hall
New York University
4 Washington Place

one block north of West 4th Street at Broadway. Rooms will be posted.
For inquiries and assistance, go to the Physics Department office, room 424 Meyer, or call (212)998-7700.

Note: For security reasons, users of NYU buildings are required to have a current valid ID with them at all times.

Course Schedule - Revised August 19, 2002

Note: first lecture starts at 9am. Other start times are approximate.

Monday, August 12			
9:15	Lecture	**Introduction to Cosmic Rays**	Farrar
10:30	Lecture	**Introduction to Mathematica**	Bramel
1:00	Lab	Mathematica Exercises	
2:30	Lab	Teachers: Discussion Students: Computer Exercises	
Tuesday, August 13			
9:00	Lecture	**Particle Detectors and Quantum Mechanics (1): The Photoelectric Effect**	Westerhoff
10:30	Lab	Measuring the Photoelectric Effect	Reichborn-Kjennerud
11:00	Lecture	**Particle Detectors (2): Photomultipliers**	Westerhoff
1:00	Lab	Photomultipliers and Scintillators How to Use an Oscilloscope	

Wednesday, August 14

9:00	Lecture	**Particle Detectors and Quantum Mechanics (3): Atomic Models**	Westerhoff
10:30	Lecture	**The Standard Model of Particle Physics**	Farrar
1:00	*Lab*	*Setting up the Detector*	
2:30	Lab	Teachers: Discussion Students: Building the Detector	

Thursday, August 15

9:00	Lecture	**Hex, Dec, Bin: How Computers Calculate**	O'Neill
10:30	Lecture	**A Portable Cosmic Ray Detector**	Herman
1:00	Lecture	**Particle Decay and Lifetime and The Exponential Function**	Mukherjee
2:30	*Lab*	*Complete the Detectors*	

Friday, August 16

9:00	Lecture	**Measurement of the Muon Lifetime**	Benzvi
10:15	*Lab*	*Setting up the Lifetime Measurement* (this needs to run over the weekend)	
11:00		Trip to Columbia University / Barnard College (Broadway at 116th Street)	
12:00		Picnic at Columbia Columbia / Barnard campus tours in small groups	
3:00		End of Picnic	

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Monday, August 19

9:00	*Lab*	**Analyze Data taken Friday on Muon Flux as a Function of Altitude**	
11:00	Lecture	**Introduction to Special Relativity (1)**	Mukherjee
1:00	Lab	*Analysis of the Muon Lifetime Measurement*	
3:00	Lecture	**Cosmic Rays (2)**	Farrar

Tuesday, August 20

9:00	Lecture	**Radioactivity and Statistics**	Westerhoff
10:10	Lab	Geiger Counters, Radioactive Sources, and the Effect of Shielding	Reichborn-Kjennerud
10:50	Lecture	**Introduction to Special Relativity (2)**	Mukherjee
1:00	*Lab*	*Air Showers - Measurement of the Coincidence Rate as a Function of Angle and of Separation of the Paddles. Some groups take data on altitude and indoor/outdoor dependence of rate.*	
3:00		Teachers: Discussion Students: Continue Lab	

Wednesday, August 21

9:00	Lecture	**Astrophysics (1)**	Farrar
10:30	Lecture	**The Cherenkov Effect - How to Build a Water Cherenkov Detector**	Westerhoff
1:00	*Lab*	*Building a Water Cherenkov Detector* *Some groups take data on altitude and indoor/outdoor dependence of rate*	
3:00	Lab	Teachers: Discussion Students: Continue Lab	

Thursday, August 22

9:00	Lecture	**Astrophysics (2)**	Farrar
10:30	Lecture	**Overview of Experiments in Astroparticle Physics (Whipple, STACEE, HiRes, Auger) and design of NYSCPT detectors**	Westerhoff
1:00	*Lab*	*Muon Lifetime Measurement with Water Cherenkov; complete data analysis*	

Friday, August 23

9:00	Lab	Any Unfinished Business in the Lab
10:30		Presentations of Action and Lesson Plans
12:00		Lunch together and group photo
1:00		Discussion of Future and Assessment of Summer Institute
2:00		Presentation of Certificates Note: Parents or friends are welcome to join for the presentation and tour
2:30		Tour of NYU campus
4:00		End of Summer Institute

General Remarks

Class schedule is subject to change.

Students must behave maturely, as expected from University students, during the entire period from 9 am to 4 pm, whether or not they are in Meyer Hall. They will be unsupervised and may leave the building during lunch, but must be on time for the afternoon session.

In case of emergency only, a message can be conveyed to a participant by calling (212) 998-7700.

The NYCPT Summer Institute is sponsored by the National Science Foundation, New York University, Columbia University, Barnard College, CUNY's Gateway Institute for Pre-College Education, and Wolfram Research.