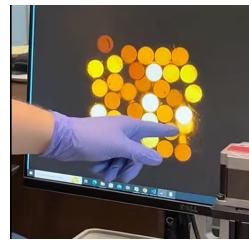


The Quarknet program at TTU in 2024 involved several activities and discussions related to high-energy particle physics and condensed matter physics. Our Program was stretched over a 5-day training and research sessions.

- **Transport Experiment:** Participants learned about and conducted experiments on the electrical conductivity of materials at varying temperatures, specifically focusing on CuSb_2 , which exhibits different conductive properties at room temperature versus super low temperatures.
 - Dr, Yun Suk Eo invited us into his research facility to experience working with quantum material and preparing it with special circuitry to see the energy relationship that can occur with the material at hand.
- **High Granularity Dual-Readout Calorimeters:** The program also covered the development and assembly of detectors for the Compact Muon Solenoid (CMS) experiment at CERN's Large Hadron Collider (LHC). This included hands-on work with optical fibers and discussions on data acquisition and analysis challenges.
 - Participants spent 2 days with the particle physics department working with grad students on an assembly module that was going to CERN at the beginning of August to be placed into some research experiments.



- **Student Involvement and Outreach:** The program emphasized the importance of involving students in scientific research and fostering their interest in physics. Dr. Akchurin discussed opportunities for students to participate in detector development, data analysis, and other research activities.



- These discussions involved ideas on how to plug our high school students into research opportunities to spark interest in particle physics.

- **Quarknet Muon Detector:** The program also touched on the operation and data collection of a Quarknet muon detector, highlighting challenges related to GPS connectivity and continuous data logging.
- **Detector Assembly:** Participants spend their final day calibrating and reassembling the muon detector at the high school.



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- The virtual conference was conducted with Shane from Fermi-Lab on our final day of the workshop as well as discussions with Dr. Lee from TTU.

Overall, the Quarknet program at TTU provided participants with valuable insights into The Quarknet program at TTU in 2024, which involved several activities and discussions related to high-energy particle physics and condensed matter physics.

