Summer Undergraduate Projects

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Ricochet

- Coherent elastic neutrino nucleus scattering project
- Focus is on new detector development, not aiming to be first to make the measurement
    - Use cryogenic crystal bolometers (looking for an increase in temperature) to look at low thresholds ~50 eV scatters
- Prototyped at MIT (Joe Formaggio and Tali Figueroa-Feliciano had the original idea)
    - Test with neutron calibration sources, then run at the MIT test reactor to see neutrino interactions

Rachel's Work

- Simulations of the detectors
    - 1: Neutron backgrounds from the reactor, which were measured with a He3 counter from SNO: sims a factor of 50 different from data in sims done at MIT
        - use the RAT package to look at He3 counter
    - 2: Simulations of the Ricochet detectors studying neutron and gamma backgrounds and shielding needs

MiniCLEAN

- Single Phase Liquid Argon detector at SNOLab
  - Focus is on technology demonstration of single phase liquid argon handling beta decay backgrounds from atmospheric Ar with Ar39
- Should be cooling and filling this summer, to prep to take background data and then an Ar-39 injection

Nathan's Work

- Physically going to Sudbury to work on MiniCLEAn during filling and cooling
    - He's renewing his passport today
    - Awaiting scheduling from the collaboration for final dates
- Simulations and analysis
    - Use RAT package to prepare analysis tools with simulations of external calibration sources