

Title: Exploration of large crystal and single crystal niobium material
Mentor: Rongli Geng

Description: The student explores various properties of large crystal and single crystal niobium to examine its suitability for fabrication of superconducting RF cavities. He/She reduces the sheet material thickness by rolling to enlarge the sheet area. He/She studies the changes of mechanical properties (such as yield strength) and examines the changes of the microstructure by using optical and scanning electron microscopes. He/She anneals the material at a temperature in the range of 600-1400 C and re-examine its properties. He/She joins two single crystal pieces into one by electron beam welding and studies and grain growth in the welded region. He/She may have an opportunity to build a superconducting single crystal niobium cavity.