Proposal Abstract:

G213.0-0.6 is an extended radio source in the Galactic anti-center area. It was first identified as a supernova remnant (SNR) through a radio continuum spectral index of -0.4 derived between the Effelsberg 35cm and 11cm data. Follow-up optical observation toward some of its filamentary structures show [SII] / Ha >= 0.5, an indication of shock excitation. However, the ratio of [NII] / Ha is lower than the other known optical SNRs. With an updated thermal free-free and non-thermal synchrotron component separation routine, we surprisingly find that G213.0-0.6 shows flat-spectrum thermal emission property, inconsistent with the previous conclusion. In addition, a part of the prominent shell structure of G213.0-0.6 shows strong thermal radio recombination line (RRL) emission. The kinematic distance over 5 kpc derived from the RRL also contradicts with the 1 kpc distance of G213.0-0.6. New high-resolution and sensitive observations with FAST can finally probe the genuine nature and the surroundings of G213.0-0.6.