TSI SEMINAR SERIES

THE DEEP SYNOPTIC ARRAY: RESULTS FROM THE FIRST FRB SAMPLE

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The origins of the millisecond-duration, energetic (>10^39 erg) fast radio bursts (FRBs) at extragalactic distances remain shrouded in mystery. Although FRBs are likely associated with neutron stars, they appear to occur in a remarkable diversity of environments. Understanding the formation of FRB sources is thus intertwined with problems in neutron-star formation. FRBs additionally form exquisite tracers of the contents and physical conditions of the otherwise ``missing'' baryons along their sightlines. The Deep Synoptic Array (DSA-110) radio telescope, now fully operational at Caltech's Owens Valley Radio Observatory, is discovering and pinpointing FRBs to host galaxies at a world-leading rate. I will present results from the first DSA-110 FRB sample. The host-galaxy properties of the sample shed new light on the origins of FRBs. DSA-110 discoveries are, for the first time, sensitively determining the split between the cosmic baryon contents around and in between galaxies. Polarization data probe the characteristic magnetizations along FRB sightlines, predominantly in the host-galaxy interstellar medium. I will conclude with an outlook towards the use of several thousands of localized FRBs with the DSA-2000 for tomography of the intergalactic medium, and to shed fresh light on cosmological problems.

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