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国台学术报告 NAOC COLLOQUIUM

2021 年 第 13 次 / No. 13 2021

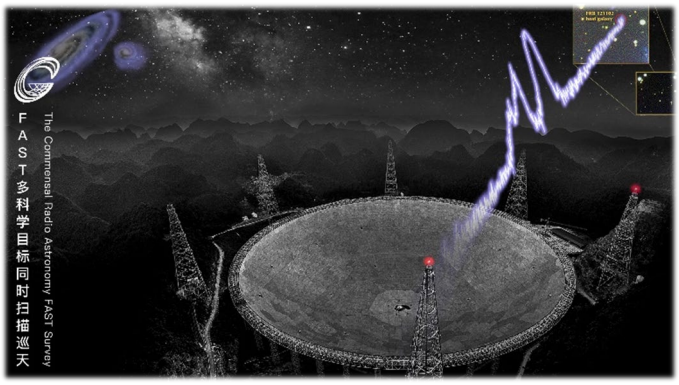
Time: Wednesday 2:30 PM, Sep 29th Location: A601, NAOC

How FAST's Bridging the Two Centuries -- Faraday Style

Dr. Di Li (NAOC)

Dr. Li, a radio astronomer, is the Chief Scientist of FAST. He pioneered several observing and data analysis techniques, including HI narrow self-absorption (HINSA) and an new inversion algorithm for solving the dust temperature distribution. These techniques facilitated important measurements of star forming regions, such as their formation time scales. Dr. Li has led multiple discoveries, including the first detection of interstellar molecular oxygen, the first new pulsar and the first new Fast Radio Burst (FRB) discovered by FAST. He won (as a member) the NASA outstanding team award (2009). He won the 2017 Distinguished Achievement Award (as a major contributor) of the Chinese Academy of Sciences (CAS). He took on numerous advisory roles in national and international organizations, including the Steering Committee of Australia Telescope National Facility (ATNF), the "Cradle of Life" science working group (as a co-chair) of the Square Kilometer Array, the CAS Major-facilities Guidance Group, and the advisory panel of the Breakthrough Listen initiative.

Abstract



Towering over the 20th century radio astronomy, the scientific engineering wonder that was Arecibo telescope was a direct child of the cold war. Its imaginative vision changed the landscape of astronomy in profound aspects. It was not alone. Modern astronomy and the human's view of cosmos are being dominated by crossing-over technologies. FAST extends such vision and trends. Based on novel and proprietary technologies, we have realized unprecedented commensality between pulsar and HI observations. The thus designed Commensal Radio Astronomy FAST survey (CRAFTS) is recording four data streams simultaneously of pulsar search, HI imaging, HI galaxies, and FRB/SETI, promising a thousand new pulsars, 10 billion HI voxels, 500K galaxies, and a few 10s FRBs, respectively. From CRAFTS and other related programs, among the notable discoveries so far are a double-neutron star system (DNS), more than 40 milli-second pulsars (MSPs), 6 new FRBs, the largest FRB burst sample (more than all previous publications combined), the first evidence for 3D alignment between pulsar spin and spatial velocities, the most stringent limit on OH abundance in galaxies, the discovery of early transition to supercriticality based on a novel HINSA Zeeman measurement of interstellar magnetic field, etc. FAST is bridging the two centuries in a Faraday style.

暨国家天文台组建 20 周年学术报告 Colloquium for the 20th anniversary of NAOC