

APR11-2011-000904

Abstract for an Invited Paper
for the APR11 Meeting of
the American Physical Society

Wide Field Radio Transient Surveys

GEOFFREY BOWER, UC Berkeley

The time domain of the radio wavelength sky has been only sparsely explored. Nevertheless, serendipitous discovery and results from limited surveys indicate that there is much to be found on timescales from nanoseconds to years and at wavelengths from meters to millimeters. These observations have revealed unexpected phenomena such as rotating radio transients and coherent pulses from brown dwarfs. Additionally, archival studies have revealed an unknown class of radio transients without radio, optical, or high-energy hosts. The new generation of centimeter-wave radio telescopes such as the Allen Telescope Array (ATA) will exploit wide fields of view and flexible digital signal processing to systematically explore radio transient parameter space, as well as lay the scientific and technical foundation for the Square Kilometer Array. Known unknowns that will be the target of future transient surveys include orphan gamma-ray burst afterglows, radio supernovae, tidally-disrupted stars, flare stars, and magnetars. While probing the variable sky, these surveys will also provide unprecedented information on the static radio sky. I will present results from three large ATA surveys (the Fly's Eye survey, the ATA Twenty CM Survey (ATATS), and the Pi GHz Survey (PiGSS)) and several small ATA transient searches. Finally, I will discuss the landscape and opportunities for future instruments at centimeter wavelengths.