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Fast Radio Bursts in the SKA era

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Fast Radio Bursts (FRBs) are millisecond-long, coherent radio flashes that exhibit the typical dispersion due to the propagation through an ionised medium. 15 years after their (serendipitous) discovery, we know that their origin is extragalactic, that a fraction of them repeats and, from the localisation of a few of them, that their environment can be quite diverse, ranging from star forming galaxies to globular clusters. Observations of an FRB event from the Galactic magnetar SGR 1935+2154 provided a tempting evidence to identify magnetars as the FRB progenitors, although it became quickly clear that magnetars like SGR 1935 cannot be the sole progenitors of the whole FRB class, requiring different progenitors for different classes of events. Needless to say that the physical mechanism that powers their emission remains largely unconstrained.

The SKA is expected to provide answers to many of the FRB unknowns: it will provide the observation and simultaneous localisation of thousands of events, allowing to study their relation with the environment and, therefore, to pin down the nature of their progenitors; it will enable measurement of their redshifts for cosmological studies, and provide exquisite measurements of their spectro-temporal and polarisation properties.

In this talk I will highlight what are the main advancements in the field that we expect in the SKA era and how the Italian community is getting ready for it through its facilities and building its own expertise in the field.

Research area

Transients

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