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Radio stars and exoplanets at low-frequencies: First detections

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One key question that astronomy is attempting to answer is whether there are habitable planets around stars other than our Sun. While we have entered an era where identifying nearby exoplanets has become standard, discerning whether the environmental conditions dictated by the host stars are suitable for life has proved far more elusive. The detection of low-frequency radio emission from an M dwarf or an exoplanet provides a direct probe of extrasolar space weather and the planet's magnetic field — information crucial for assessing the potential habitability of the planet. In this talk, I will outline our LOFAR survey of stellar systems, with a focus on our recent detection of strong, highly circularly polarised low-frequency radio emission associated with nearby stars — the expected signpost of star-exoplanet interactions. I will discuss how our survey represents the most comprehensive observations of stellar systems at low frequencies, and the implications of this new population in understanding the magnetosphere of M dwarfs and exoplanetary magnetic fields. I will conclude with our progress in determining the expected periodicity of the radio emission from star-planet interactions.