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PUBLIC HARLEY WOOD LECTURE - Per Aspera Ad Astra: The future of astronomy is here! Discovering ORC's and many other new wonders of the Universe

Tuesday 8 July 2025 19:00 (1 hour)

This is an exciting time for the discovery of new astronomical objects through various multi-messengers. New-generation surveys across the entire waveband present a significant opportunity to study different objects and processes in the elemental enrichment of the interstellar medium (ISM). We reflect on our cosmic past, present, and future.

SKA pathfinders' observations in the radio spectrum, with high sensitivity, detect new objects in our Galaxy and other galaxies. Neutrino and gamma-ray studies provide answers to the long-standing question in high-energy astrophysics: Where do cosmic rays and ultra-high-energy particles come from? The gamma-ray emission observed from some middle-aged supernova remnants (SNRs) is now understood to originate from distant populations of cosmic rays (likely accelerated locally) interacting with gas, but there is still much work to be done to account for the Galactic cosmic-ray flux. Young PeV gamma-ray supernova remnants require different techniques to address the question of cosmic-ray acceleration. Among others, the Cherenkov Telescope Array will enable us to achieve this.

I will review the latest scientific outcomes from various new and sensitive surveys, such as ASKA and MeerKAT (radio). This is in addition to large multi-messenger surveys from XMM-Newton and eROSITA (X-rays), Herschel and Spitzer (IR), MCELS (optical), KM3NeT and HESS (gamma rays).

These are the golden days for Astronomy. ...and, maybe, the Earth deserves to be called a Galactic National Park?

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