



SEMINAR 專題演講



國立中央大學 太空科學與工程學系

Department of Space Science and Engineering, National Central University

Time

Friday, June 5, 2026
15:30 – 17:00

Dust in the Heliosphere: An Unresolved Hazard to Space Assets

Place

健雄館 (科四館)

S4-917 教室
Room S4-917,
Chien-Shiung Building

Dr. Mark Adrian
Physics Department, Auburn University, USA
Associate Research Professor

Dust is a ubiquitous component of the universe as evidenced by its observational presence in most proto-stellar nebulae and young, newly formed stellar systems. Dust in our own solar system creates the observational nuisance for astronomers known as zodiacal light and is found in the striking structures known as planetary rings. Some of this same zodiacal dust finds its way down to Earth, existing as a component of that annoying dust layer that forms on your living room coffee table.

While dust often presents an observational inconvenience to astronomers, a quantitative description of distribution of dust within our own heliosphere/solar system is unknown, even at 1-AU. Near the planets, numerical simulations assuming gravitational resonance predict the presence of near-isotropic, corotating, circumplanetary dust rings. In the case of Earth at 1-AU, however, in-situ observations indicate the presence of a more complex, patchy, anisotropic distribution in stark contrast to numerical prediction. The resolution of these disparities between numerical and observational study is crucial to development of predictive models of the distribution of heliospheric dust as risk mitigation tools for future manned/unmanned missions.

After a brief tutorial on what is “*dust*” and its “*potential*” origins, this talk will discuss the dangers that dust poses to space assets, both in near-Earth and deep space, before it focuses on **STEREO WAVES (S/WAVES)** detection of nano- and micron-size dust impacts and its insights into the distribution of dust near Earth at 1-AU.