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## **ICTS Astrophysics & Relativity Seminar**

- Title** : Search for dark matter over a wide mass range: using JWST and neutrino telescopes to search for non-gravitational signatures of dark matter
- Speaker** : Ranjan Laha (Indian Institute of Science, Bengaluru)
- Date** : Thursday, 11 September 2025
- Time** : 3:30 PM (IST)
- Abstract** : I will discuss two different ways to search for dark matter (DM).  
First, I will discuss how we used JWST data to probe eV-scale QCD axion DM or axion-like particle (ALP) DM decaying into two photons. This will produce a distinct line signature in the spectroscopic observations made by JWST. Using the latest NIRSpec IFU spectroscopic observations from JWST, we put some of the strongest bound on the photon coupling for QCD axion/ ALP DM in the mass range between 0.47 and 2.55 eV.  
In the second part of my talk, I will discuss how neutrino telescopes like IceCube and Super-Kamiokande can probe DM - electron scattering. DM can get captured inside the Sun due to DM - electron scattering and it can annihilate into neutrinos and anti-neutrinos. Using latest neutrino measurements, we set world leading limit on DM - electron scattering for DM masses between 10 GeV to about  $10^5$  GeV.
- Venue** : Feynman Lecture Hall  
Zoom Link: <https://icts-res-in.zoom.us/j/93112451514?pwd=ab7cLhX44Z1O1hr1xYRtFRySWLXphr.1>  
Meeting ID: 931 1245 1514  
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