

## ICTS Seminar

- Title** : Unravelling the growth of the first black holes using JWST and PTAs
- Speaker** : Hamsa Padmanabhan (Universite de Geneve, Switzerland)
- Date** : Wednesday, 10<sup>th</sup> July 2024
- Time** : 4:00 PM (IST)
- Abstract** : An outstanding problem in cosmology is the formation of the first supermassive black holes (SMBHs) in the Universe. Galaxy mergers at high redshifts trigger the activity of their central SMBHs, eventually leading to their coalescence – and a potential source of low-frequency gravitational waves (GWs) detectable by Pulsar Timing Arrays (PTAs). I will describe the use of the recent statistics of dual active galactic nuclei (AGN) in the James Webb Space Telescope (JWST) data to address aspects of the feedback and evolution scenarios of SMBHs. The JWST data provide evidence for the members of a binary BH ‘shining’ at the same time, rather than independently - which is consistent with gas-rich mergers triggering concurrent AGN activity. This conclusion is supported by the recent NANOGrav PTA measurements, whose upper limits on the GW strain lie below those expected from extrapolating the dual AGN fraction. I will discuss possible consequences.
- Venue** : Emmy Noether Seminar Room
- Zoom Link: <https://icts-res-in.zoom.us/j/97383621362?pwd=iLCabFWHzVUay4m7CfTaYu3YeDAeMn.1>  
Meeting ID: 973 8362 1362  
Passcode: 091011