

**A Report on Talk
by Dr. Hashima Hasan
on
“NASA Flight Mission: JWST”**

held at FTK Centre for Information Technology,
Jamia Millia Islamia, New Delhi

The FTK-Centre for Information Technology and the Centre for Theoretical Physics, Jamia Millia Islamia jointly organised a talk by Dr. Hashima Hasan Program Scientist, James Webb Space Telescope (JWST) and Education and Public Outreach Lead for Astrophysics, at National Aeronautics and Space Administration (NASA).

In her role as Program Scientist, Dr. Hasan is responsible for monitoring and managing the science program for the Webb Telescope. She makes sure that its mission remains possible and true to NASA strategic objectives. Dr. Hasan has been the program scientist for many of NASA missions, such as the Wide-field Infrared Survey Explorer, Gravity and Extreme Magnetism SMEX (GEMS), Stratospheric Observatory for Infrared Astronomy, Hubble Space Telescope, Explorer Program and more.

The JWST mission, whose launch is scheduled in 2018, is an orbiting infrared observatory that will complement and extend the discoveries of the Hubble Space Telescope, with longer wavelength coverage and greatly improved sensitivity. The longer wavelengths enable the Webb telescope to look much closer to the beginning of time and to hunt for the unobserved formation of the first galaxies, as well as to look inside dust clouds where stars and planetary systems are forming today.

In her talk, Dr. Hashima Hasan started with an overview of Astrophysics missions undertaken by NASA since 1995 (Hubble space Telescope). Explaining the evolution in telescopes through years, she explained the need for such a large mirror telescope. Giving details of various science payloads on JWST, she related the various mission goals with the powerful Near Infrared Camera (NIRCam), Near Infrared Spectrograph (NIRSpec), and Mid Infrared Instrument (MIRI).

Taking audience on a mesmerizing journey in the cosmological history, Dr. Hasan showed how JWST mission can change the way we look at the universe. The power of infra-red vision, which allows the JWST to see through dust clouds, could bring us face to face with the birth of stars and proto-planetary systems. It can greatly improve our understanding of the formation of our own solar system. So far the farthest we have seen in our universe is through the Hubble Deep Field Infra-red camera (~480 million years since Big-Bang). In

comparison, the JWST would allow us to see much deeper in space (~200 million years since Big Bang). This means we can see the first light from the earliest galaxies.

With an over view of the Scientific Discovery potential of the mission namely,

1. Finding water on other planets
2. Unveil new born Solar systems
3. Mapping evolution of Galaxies
4. Finding first Stars and Galaxies

Dr. Hasan ended this one hour journey in deep space with a beautiful animation of JWST space-craft deployment, showing some of the major innovations of this mission, like the Foldable Mirror and a deployable Sunshield.

About Dr. Hashima Hasan

Dr. Hashima Hasan is an alumni of Aligarh Muslim University. In 1976 she received D.Phil. in Theoretical Physics from the University of Oxford, U.K. Till 1985, Dr. Hasan conducted post doctoral research at Tata Institute for Fundamental Research, Bombay; Duke University, USA; US Environmental Protection Agency, USA; Bhabha Atomic Research Center, Bombay; and Space Telescope Science Institute, USA. She had been Program Scientist at NASA Headquarters since 1994 for numerous missions including HST, IUE, GALEX, GPB, and Explorer Program. Currently, Dr. Hasan is Program Scientist for James Webb Space Telescope, WISE, Keck Telescope, Large Binocular Telescope Interferometer; Discipline Scientist: NASA Exoplanet Science Institute, Astrophysics Archives; Ultraviolet and Visible Astrophysics; and Astrophysics Division Lead for Astrophysics Education and Public Outreach. She has received several NASA awards.