
Departmental Seminar

Seminar Title	: Overlay Satellite-Aerial-Terrestrial Networks with SWIPT and Solar Battery-Powered A2A Communications.
Speaker	: Anuradha Verma
Supervisor	: Prof Pankaj Sharma
Venue	: EC303, Seminar Room
Date and Time	: 11 Jul 2024 (11.00AM)
Abstract	: The performance of an overlay low earth orbit (LEO) satellite-based satellite-to-ground (S2G) and a coexisting air-to-air (A2A) networks is investigated. The A2A network comprises a high-altitude platform (HAP) serving as an aerial transmitter (ATx) and a low-altitude platform (LAP) functioning as an aerial receiver (ARx). For the longevity of its service time, the ATx is assumed to be outfitted with the simultaneous wireless information and power transfer (SWIPT) as well as a solar energy harvesting subsystem. Here, the ATx can utilize the electrical energy harvested from the satellite's radio-frequency signal in the first hop along with that stored in its fixed solar energy harvesting battery to retransmit the combined satellite and A2A signals in the second hop. The retransmitted combined signal is thus received by a randomly located terrestrial user in the S2G network as well as by the ARx. As such, this combined operation of S2G and A2A networks is widely known as overlay spectrum sharing. For this system set-up, by considering the random locations for the LEO satellite, terrestrial user, and ARx, we analyze the outage performance of both the S2G and A2A networks in the presence of shadowed-Rician and Rician fading environments for S2G and A2A links, respectively. We verify the theoretical analysis by simulations and present relevant insights.