

# START-2026 Theme: “Observations from space”

## Lecture Schedule

No.	Date and Time (hrs)	Lecture Title	Synopsis	Speaker (Prof./Dr./Mr./Ms.)
	11 <sup>th</sup> March 2026 15:00 – 15:30	<b>Inaugural Session</b>		
<b>Introductory Lecture (Setting the Context of START 2026)</b>				
1	11 <sup>th</sup> March 2026 15:45 – 16:30	What, Why and How do we Observe from Space: Context Lecture to the START-2026	An overview lecture	Tirtha Pratim Das, Director, SPO, ISRO HQ
<b>I. Foundations &amp; Motivation</b>				
2	12 <sup>th</sup> March 2026 15:15 – 16:00	<b>The Space Qualification and Environment</b>	Discuss on harsh environment, space qualification, vacuum effects (outgassing), thermal cycling in sunlight vs. shadow, and the impact of solar flares and cosmic rays on sensitive electronics, Challenges faced by astronauts in space environment	Srikar, URSC
3	12 <sup>th</sup> March 2026 16:00 – 16:45	<b>Orbital Mechanics</b>	Kepler’s Laws and the specific utility of different orbits. Contrast Geostationary (weather/comm) with Polar/Sun-synchronous orbits (consistent lighting for Earth imaging)	M Srikant, URSC
4	13 <sup>th</sup> March 2026 15:15 – 16:00	<b>The Electromagnetic Spectrum</b>	Map specific spectral bands (Gamma to Radio) to the physical processes they reveal in the universe	Somak Roychowdhury, VC, Ashoka University
<b>II. Earth Observation (Remote Sensing)</b>				
5	13 <sup>th</sup> March 2026 16:00 – 16:45	<b>Principles of Remote Sensing</b>	Distinguish between passive (sunlight reflection) and active (laser/radar) sensing. Introduce spatial, spectral, and temporal resolution as the "Big Three" metrics	R.P.Singh, IIRS
6	16 <sup>th</sup> March 2026 15:15 – 16:00	<b>Optical hyperspectral Imaging</b>	How multi-spectral imaging differentiates between urban concrete, water bodies, and healthy forests	B.N.Sharma, SAC
7	16 <sup>th</sup> March 2026 16:00 – 16:45	<b>Microwave &amp; Radar (SAR)</b>	Detail how Synthetic Aperture Radar (SAR) "sees" through clouds and smoke. Explain	Dharmendra Kumar Pandey, SAC

			"backscatter" and its use in flood mapping and deforestation	
8	17 <sup>th</sup> March 2026 15:15 – 16:00	<b>Thermal Remote Sensing</b>	Focus on Planck's Law. Explain how measuring long-wave infrared allows us to monitor global warming, ocean currents, and urban heat islands at night	Mehul Pandya, SAC
9	17 <sup>th</sup> March 2026 16:00 – 16:45	<b>Atmospheric Sounding</b>	Describe "limb sounding" and vertical profiling. Cover how sensors detect trace gases and moisture levels at different altitudes to predict weather and radio sounding	Munn Vinayak Shukla, SAC
<b>III. Space-Based Astronomical observations</b>				
10	18 <sup>th</sup> March 2026 15:15 – 16:00	<b>High-Energy Astrophysics</b>	Focus on "grazing incidence" mirrors. Explain why X-rays require special optics and what they reveal about black hole accretion disks and supernovae	Santosh Vadawale, PRL
11	18 <sup>th</sup> March 2026 16:00 – 16:45	<b>Ultraviolet Astronomy</b>	Observation of the "hot universe." Why UV is critical for studying the birth of massive stars and the composition of the interstellar medium.	Girish V, SPO, ISRO HQ
12	20 <sup>th</sup> March 2026 15:15 – 16:00	<b>Visible Light Astronomy</b>	Discuss the elimination of "atmospheric breaking" (scintillation). Explain how space allows for ultra-stable photometry and extremely deep-field imaging	Anandamayee Tej, IIST
13	20 <sup>th</sup> March 2026 16:00 – 16:45	<b>Infrared Astronomy</b>	Focus on the need for cryogenic cooling. Explain how IR wavelengths penetrate dust clouds to reveal protostars and redshifted galaxies from the early universe	Sashikiran Ganesh , PRL
14	23 <sup>rd</sup> March 2026 15:15 – 16:00	<b>Sub-millimeter Astronomy</b>	Cold-universe physics, thermal emission from dust and molecular rotational transitions. Why high-altitude, dry sites are required to avoid water vapor absorption and how this field reveals star-forming nurseries and the Early Universe	Bhaswati Mookerjee, TIFR

15	23 <sup>rd</sup> March 2026 16:00 – 16:45	<b>Radio Astronomy from Space</b>	Emission mechanisms in radio astronomy, 21-cm emission, brightness temperature, antenna and radio telescope fundamentals, planetary radio emission, exoplanet radio emission, cosmology with 21 cm, previous and upcoming radio astronomy missions from space.	Mayuri Rao, RRI
16	24 <sup>th</sup> March 2026 15:15 – 16:00	<b>Multi-Messenger Astronomy</b>	Discuss the synergy between "Light" and "Non-light" signals. How space telescopes are alerted to follow up on gravitational wave detections or neutrino bursts.	Somak Roychowdhury, VC, Ashoka University
<b>IV. Instrumentation &amp; Technology for Space-Based Exploration</b>				
17	24 <sup>th</sup> March 2026 16:00 – 16:45	<b>Optics in Space</b>	Discuss material choices (e.g., Beryllium) for lightness and thermal stability. Cover the complexity of folding mirrors and "wavefront sensing" to maintain focus	B. Vishweshwar Rao, Sci./Eng.- SG, LEOS
18	25 <sup>th</sup> March 2026 15:15 – 16:00	<b>Detectors and Sensors</b>	Compare CCD vs. CMOS technology. Explain the "Photoelectric Effect" and how quantum efficiency determines how many photons are actually captured	Nitesh Thapa, SAC
19	25 <sup>th</sup> March 2026 16:00 – 16:45 (Unavailable during 25-31 March)	<b>Spectroscopy Fundamentals</b>	How gratings and prisms disperse light. Focus on identifying "spectral lines" to determine temperature, pressure, and chemical abundance	Mudit Srivastava, PRL
20	26 <sup>th</sup> March 2026 15:15 – 16:00	<b>Photometry and Astrometry</b>	The measurement of light intensity over time (light curves) and the precise mapping of stellar positions to detect exoplanets via the wobble/transit methods	Priyanka Chaturvedi, TIFR
21	26 <sup>th</sup> March 2026 16:00 – 16:45	<b>Mass Spectrometry</b>	How mass spectrometers carry information about planetary atmosphere; working principle, examples from recent missions	M B Dhanya, SPL
22	30 <sup>th</sup> March 2026 15:15 – 16:00	<b>Langmuir Probes and</b>	Introduction to Langmuir Probes, working principle; Particle detectors,	Smitha V T, SPL

		<b>Particle Measurements</b>	parameters measured (electron temperature, electron concentration, etc.)	
23	30 <sup>th</sup> March 2026 16:00 – 16:45	<b>Measurement of Planetary Ground Vibrations</b>	Seismometers for planetary exploration, MEMS-based seismometers, working principles, example of Ch-3 seismometer	Jiju John, LEOS
<b>V. Data Processing and Research Opportunities</b>				
24	1 <sup>st</sup> April 2026 15:15 – 16:00	<b>An Introduction to SPICE</b>	The need of contextual information in space-based observation, Concept of Kernels, types of Kernels, etc	Manish Gupta, URSC
25	1 <sup>st</sup> April 2026 16:00 – 16:45	<b>Space Science Payload Data Management &amp; Repository: A Gateway to Space Science Data</b>	"Deep Space Network" (DSN). Discuss on different data levels, compression, bit-error rates, and the constraints of limited bandwidth from distant spacecraft; data archival philosophy	Himanshu Pandey, ISTRAC
26	2 <sup>nd</sup> April 2026 16:00 – 16:45	<b>Space Science and Technology Career Opportunities in India</b>	Various domains of Space Science, Major Laboratories/ Institutes / Centres involved in Space Research, Opportunities for student internship, project and apprenticeship.	K. Praveen Kumar, ISRO HQ