Twenty Nine IIRS Outreach Programme

On

# Hyperspectral Remote Sensing and Its Applications

| **Coordinator:**<br><br>**Speakers/ Resource Persons:** | **Time (Hrs)** | **Resource Persons** |
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| **(19.02.2018)** | | |
| **First Session: Hyperspectral Remote Sensing (HRS): An Overview and Applications**<br><br>- Principle of Hyperspectral Remote Sensing (HRS)<br>- Terrestrial, Airborne and Space borne HRS<br>- Causes of absorption,<br>- Multispectral Vs Hyperspectral,<br>- Overview of hyperspectral data processing,<br>- Hyperspectral data processing softwares<br>- Limitations of hyperspectral data | 16:00-17:30 | Shri. Vinay Kumar |
| **(20.02.2018)** | | |
| **Second Session: Hyperspectral remote sensing: Platform and sensors**<br><br>- Past, Present and Future HRS sensors,<br>- Airborne hyperspectral sensors,<br>- Spaceborne (Earth and Extra-terrestrial) hyperspectral sensors,<br>- Ground based hyperspectral sensors<br>- ISRO Program on HRS Imaging<br>- Future ISRO hyperspectral Sensors and their characteristics | 16:00-17:30 | Shri. Vinay Kumar |
| **(21.02.2018)** | | |
| **Third Session: Hyperspectral Image Pre-processing**<br><br>- Radiometeric errors (sensor, atmospheric related)<br><br>- Bad band and bad column removal<br>- Atmospheric correction (relative and absolute) | 16:00-17:30 | Mrs. Manu Mehta |
| **(22.02.2018)** | | |
| **Fourth Session: Demonstration on Hyperspectral Data Pre-processing**<br><br>- Sensor error correction (Bad band & bad column removal)<br>- Atmospheric correction using FLAASH | 16:00-17:30 | Shri. Vinay Kumar |

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| **(23.02.2018)** | | |
| **Fifth Session: Data dimensionality reduction**<br><br>- Data Dimensionality reduction<br>- Endmember selection | 16:00-17:30 | Mrs. Richa U Sharma |
| **(26.02.2018)** | Break | |
| **(27.02.2018)** | | |
| **Sixth Session: Demonstration on spectro-radiometer and spectral library creation**<br><br>- Spectral Data collection using ground spectro-Radiometer<br>- Creation of Spectral library | 16:00-17:30 | Shri. Vinay Kumar |
| **(28.02.2018)** | | |
| **Seventh Session: Optical and Thermal Hyperspectral Image Classification**<br><br>- Pixel based hard classification algorithms<br>- Pixel based soft classification algorithms<br>- Role of Indices for hyperspectral data classification – showcase of in-house tool<br>- Accuracy assessment methods – hard and soft output | 16:00-17:30 | Dr. Anil Kumar |
| **(01.03.2018 to 04.03.2018)** | **Holi Holidays** | |
| **(05.03.2018)** | | |
| **Eighth Session: Demonstration on Hyperspectral data classification**<br><br>- Classification using Spectral Angle Mapper (SAM) and Linear Spectral Unmixing (LSU) | 16:00-17:30 | Shri. Vinay Kumar |
| **(06.03.2018)** | | |
| **Ninth Session: Hyperspectral Remote Sensing for Agriculture and soil Studies**<br><br>- Soil type Studies<br>- Soil fertility Studies<br>- Crop related studies | 16:00-17:30 | Shri. Justin George K |
| **(07.03.2018)** | | |
| **Tenth Session: Hyperspectral Remote Sensing for Forestry Applications**<br><br>- Plant species/community level detection and discrimination.<br>- Canopy chlorophyll estimation.<br>- Foliar nitrogen content estimation.<br>- Vegetation spectral library | 16:00-17:30 | Dr. Hitendra Padalia |

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| **(08.03.2018)** | | |
| **Eleventh Session: Hyperspectral remote Sensing for Geological Applications**<br><br>- Spectra of minerals and their diagnostic absorptions<br>- Mineral Mapping using hyperspectral data<br>- Planetary HRS<br>- Case studies, Planetary Geology | 16:00-17:30 | Mrs. Richa U Sharma |
| **(09.03.2018)** | | |
| **Twelfth Session: Hyperspectral Remote Sensing for Urban Studies**<br><br>- Road extraction and mapping<br>- Extraction of Impervious surfaces<br>- Hyperspectral classification for urban areas | 16:00-17:30 | Ms. Asfa Siddiqui |
| **(12.03.2018)** | | |
| **Thirteenth Session: Hyperspectral Remote Sensing for Water and snow cover Studies**<br><br>- Water Quality Mapping<br>- Snow Physical Parameters<br>- Recent attempts on Soil Moisture Mapping | 16:00-17:30 | Dr. Vaibhav Garg |
| **(13.03.2018)** | | |
| **Panel discussion** | 16:00-17:30 | By Programme Faculty |