



SNS COLLEGE OF TECHNOLOGY

**An Autonomous Institution
Coimbatore - 35**

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DEPARTMENT OF AGRICULTURE ENGINEERING

19AGT302 – GIS AND REMOTE SENSING

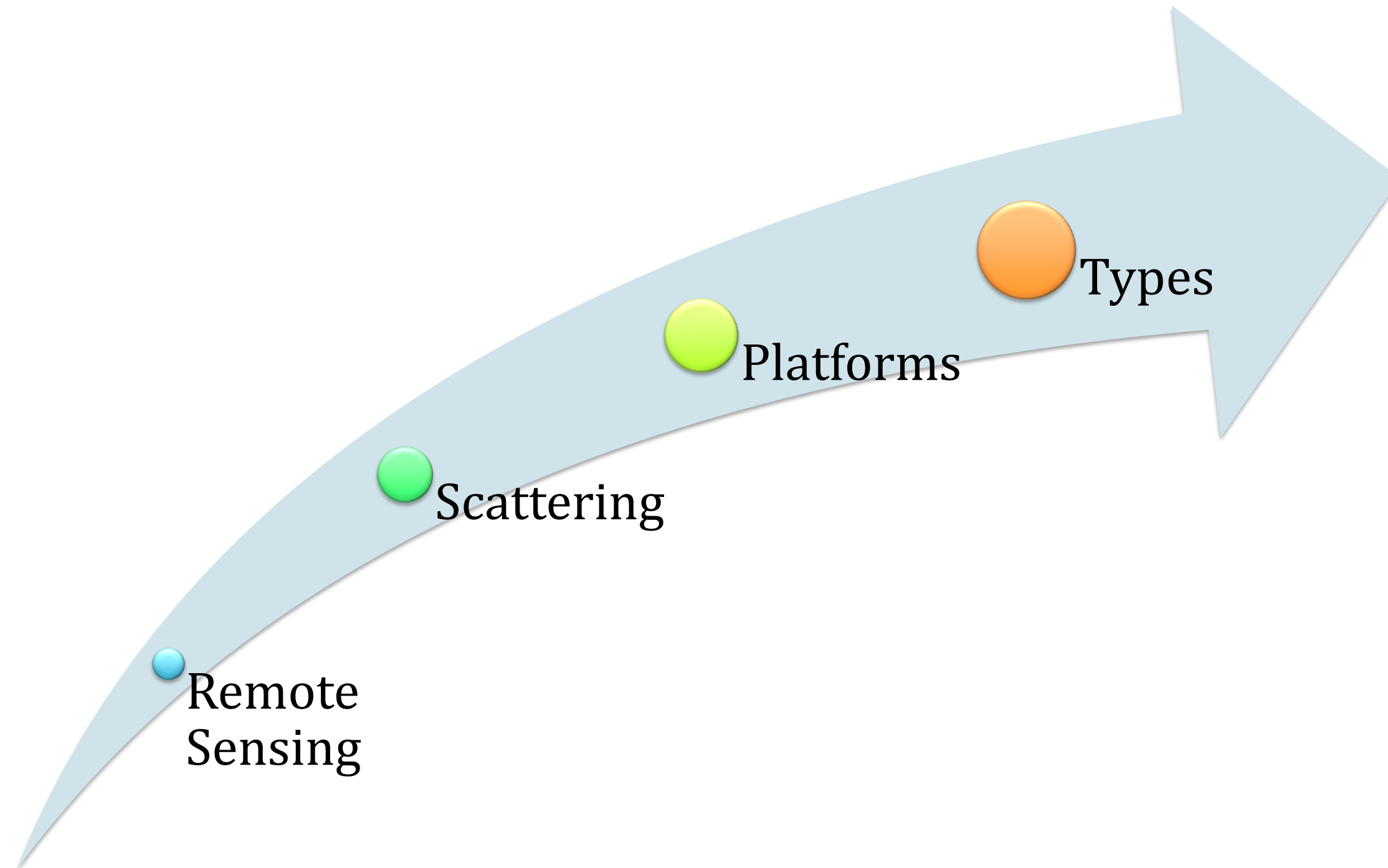
III – YEAR V SEMESTER

UNIT 2 – REMOTE SENSING SATELLITES AND SENSORS

TOPIC 2 – APPLICATIONS



Last Class Review





Introduction



- ❖ Remote sensing may be used for numerous applications including weapon guidance system (e.g., the cruise missile), medical image analysis (e.g., X-raying a broken arm), non-destructive evaluation of machinery and products (e.g., of the assembly line), analysis of the earth's resources, etc.
- ❖ Earth resource information is defined as any information concerning terrestrial vegetation, soils, minerals, water, ocean, urban infrastructure etc. as well as certain atmospheric characteristics.



Remote sensing

- ❖ Remote sensing system is able to provide a synoptic view of a wide area in a single frame. The width of a single frame, or swath width, could be 60 km x 60 km in the case of the European SPOT satellite, or as wide as 185 km x 185 km in the case of Landsat, or 23 km x 23 km in the case of LISS-IV of IRS P6 .
- ❖ Remote sensing systems can provide data and information in areas where access is difficult as rendered by terrain, weather, or military security.
- ❖ The towering Himalayas and the bitterly cold Antarctic regions provide good examples of these harsh environments.
- ❖ Active remote sensing systems provide cloud-free images that are available in all weather conditions, day or night.
- ❖ Such systems are particularly useful in tropical countries where constant cloud cover may obscure the target area.
- ❖ In 2002, the United States military initiatives in Afghanistan used remote sensing systems to monitor troops and vehicle convoy movements at spatial resolutions of less than one meter to a few meters.



Applications

- ❖ Each sensor in remote sensing system is designed for a specific purpose.
- ❖ With optical sensors, the design focuses on the spectral bands to be used. With radar imaging, the incidence angle and microwave band used plays an important role in defining which applications the sensor is best suited for.
- ❖ Each application itself has specific demands, for spectral resolution, spatial resolution, radiometric resolution and temporal resolution.
- ❖ In the last four decades it has grown as a major tool for collecting information on almost every aspect on the earth.
- ❖ With the availability of very high spatial resolution satellites in the recent years, the applications have multiplied.
- ❖ In India remote sensing has been used for various applications during the last four decades and has contributed significantly towards development.



Agriculture

- ❖ Agriculture plays a dominant role in economies of both developed and undeveloped countries. Satellite and airborne images are used as mapping tools to classify crops, examine their health and viability, and monitor farming practices. Agricultural applications of remote sensing include the following:
 - ❖ crop type classification
 - ❖ crop condition assessment
 - ❖ crop yield estimation
 - ❖ mapping of soil characteristics
 - ❖ mapping of soil management practices
 - ❖ compliance monitoring (farming practices)
 - ❖ Monitoring of pests and Diseases.



Forestry

- ❖ Forests are a valuable resource providing food, shelter, wildlife habitat, fuel, and daily supplies such as medicinal ingredients and paper. Forests play an important role in balancing the Earth's CO₂ supply and exchange, acting as a key link between the atmosphere, geosphere, and hydrosphere. Forestry applications of remote sensing include the following:
- ❖ Reconnaissance mapping: objectives to be met by national forest/environment agencies include forest cover updating, depletion monitoring, and measuring biophysical properties of forest stands.
- ❖ Commercial forestry: of importance to commercial forestry companies and to resource management agencies are inventory and mapping applications; collecting harvest information, updating of inventory information for timber supply, broad forest type, vegetation density and biomass measurements.
- ❖ Environmental monitoring: conservation authorities are concerned with monitoring the quantity, health, and diversity of the Earth's forests..



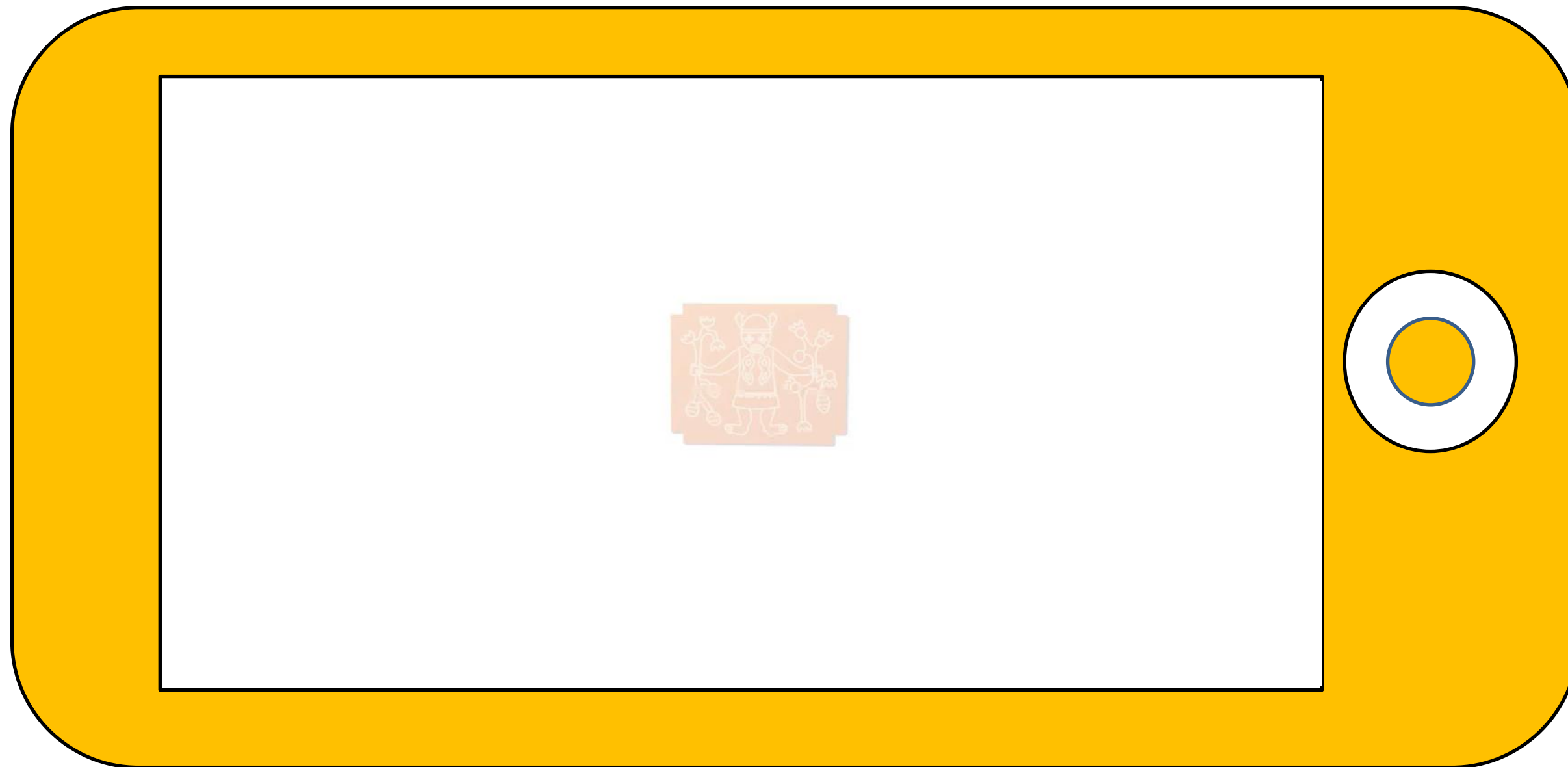
Geology



- ❖ Geology involves the study of landforms, structures, and the subsurface, to understand physical processes creating and modifying the earth's crust. It is most commonly understood as the exploration and exploitation of mineral and hydrocarbon resources, generally to improve the conditions and standard of living in society.
- ❖ Geological applications of remote sensing include the following:
 - ❖ Surficial deposit / bedrock mapping
 - ❖ Lithological mapping
 - ❖ Structural mapping
 - ❖ Sand and gravel (aggregate) exploration/ exploitation
 - ❖ Mineral exploration



Reference Videos





See You at Next Class!!!!