SNS COLLEGE OF TECHNOLOGY

An Autonomous Institution
Coimbatore – 35

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Approved by AICTE , New Delhi and Affiliated to Anna University , Chennai.

DEPARTMENT OF AGRICULTURAL ENGINEERING

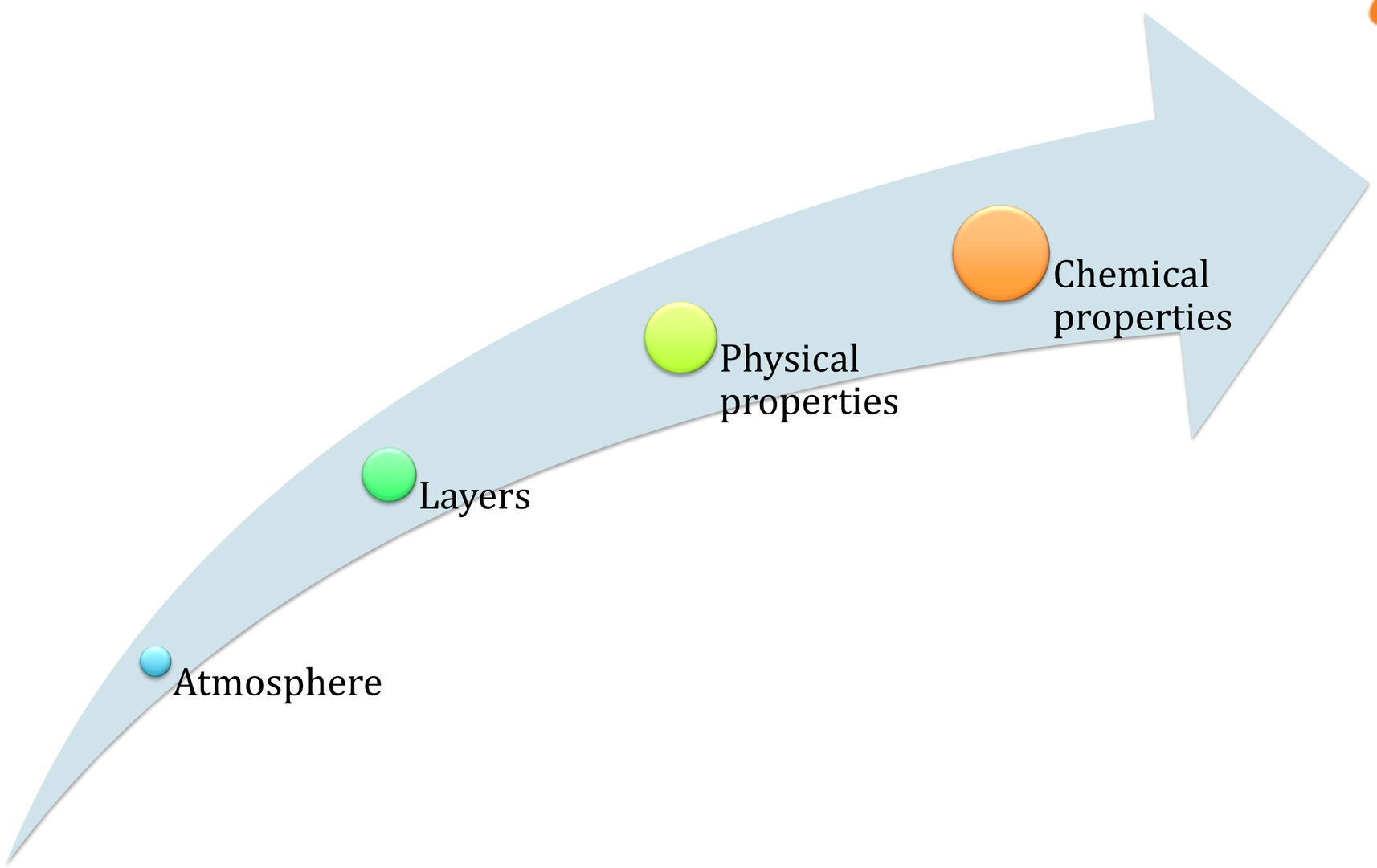
19AGE401 – CLIMATE CHANGE AND ADAPTATION

IV – YEAR VII SEMESTER

UNIT 2 – ATMOSPHERE AND ITS COMPONENTS

TOPIC 3 –VERTICAL STRUCTURE OF ATMOSPHERE

Last Class Review

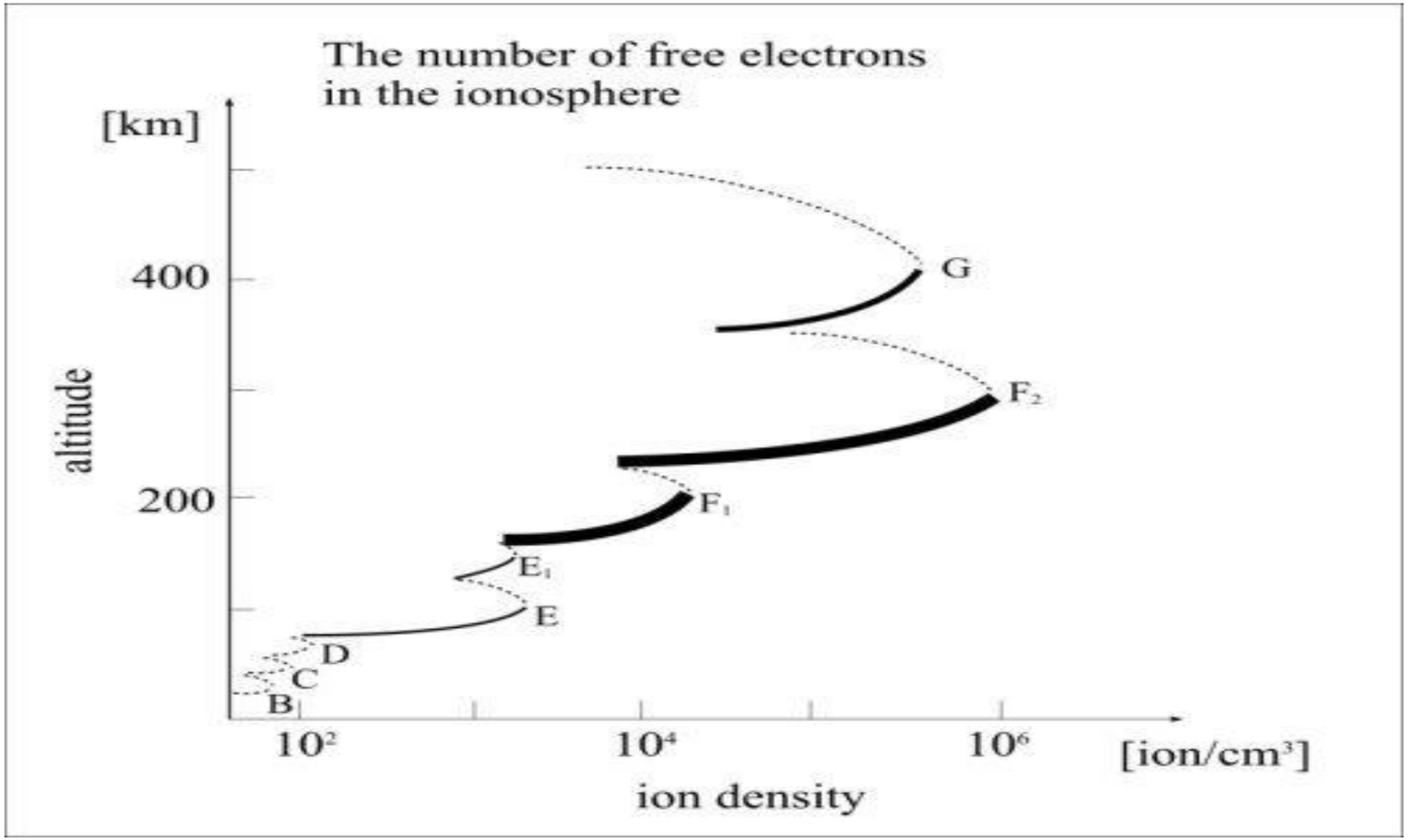


Vertical Structure of the Atmosphere

Vertical change of composition

- According to the homogeneity of atmospheric composition, two layers can be defined in the atmosphere.
- The lower layer, up to an altitude of about 80 km above sea level is the homosphere, where due to the continuous turbulent mixing the composition of the atmosphere is relatively constant for chemical species which have long mean residence times.
- This region is closed by a thin transition layer, called turbopause.
- Above the turbopause, in the heterosphere, the molecular diffusion dominates and the chemical composition of the atmosphere becomes stratified and varies according to the molecular mass of chemical species (Figure 1).
- The lower heterosphere are dominated by nitrogen and oxygen molecules and the lighter gases being concentrated in the higher layers.
- Up to 1,000 km the oxygen atoms and above this height the helium and hydrogen are the dominant species.

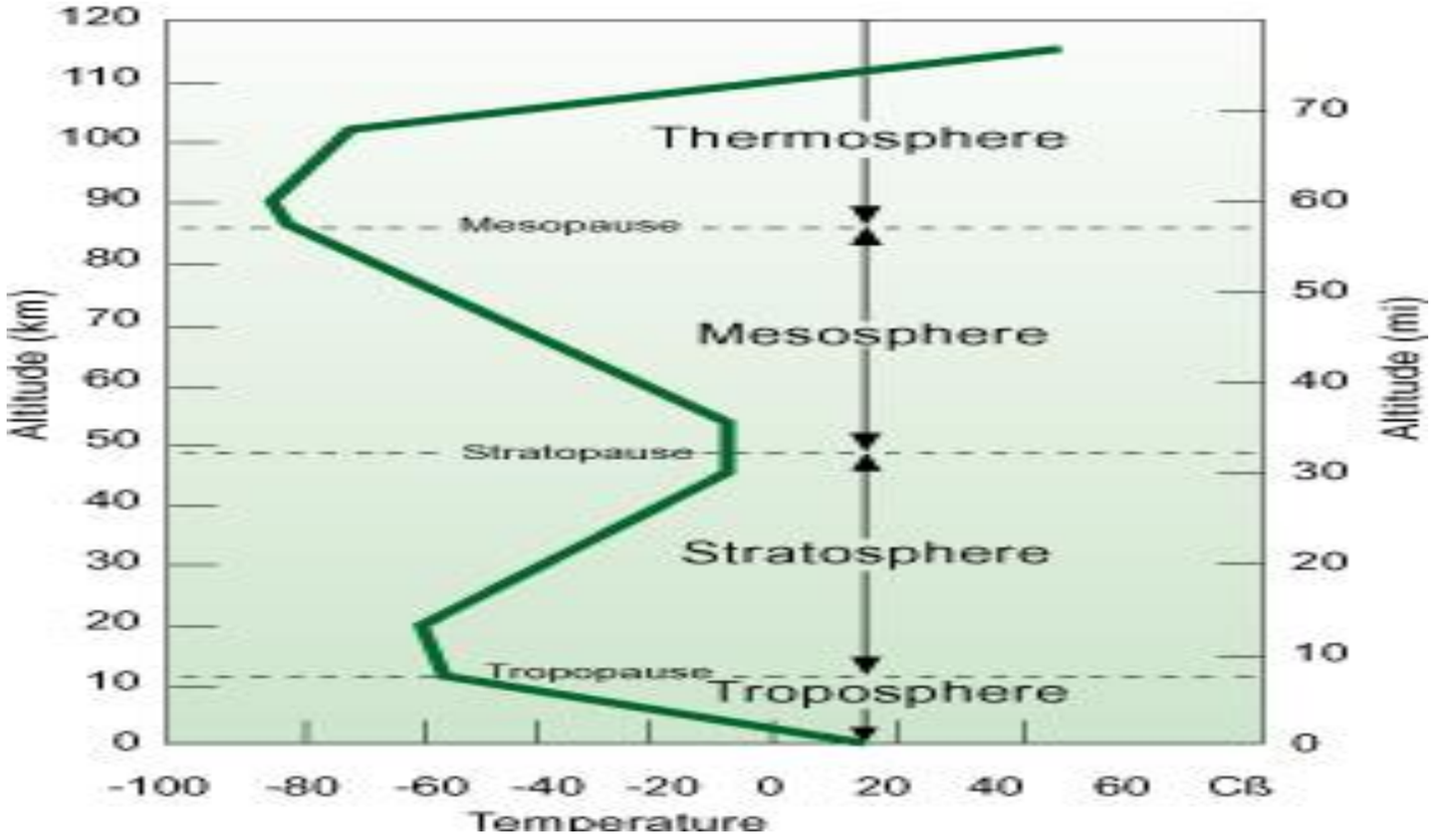
Vertical Structure of the Atmosphere



Vertical Structure of the Atmosphere

- In the upper part of the atmosphere – from ***about 60 km to 2000 km above the Earth's surface – ionic species or free radicals (O^+, O_2^+, NO^+, N_2^+, free electrons)*** can also be found, and high number of ionized particles affect ***the propagation of radio waves.***
- This region of the atmosphere is called ***ionosphere.***
- There are ***three important layers*** in the lower part of the ionosphere ***(at altitudes between about 60 km and 600 km),*** where the absorption of solar extreme ultraviolet radiation and x-rays ionize the neutral atmosphere.
- These are the D (60–90 km), E (90–150 km) and F regions (150–500 km) with F1 and F2 sub-layers.
- The ion density of each layer depends on the ***solar activity and time of day*** (Figure 2).

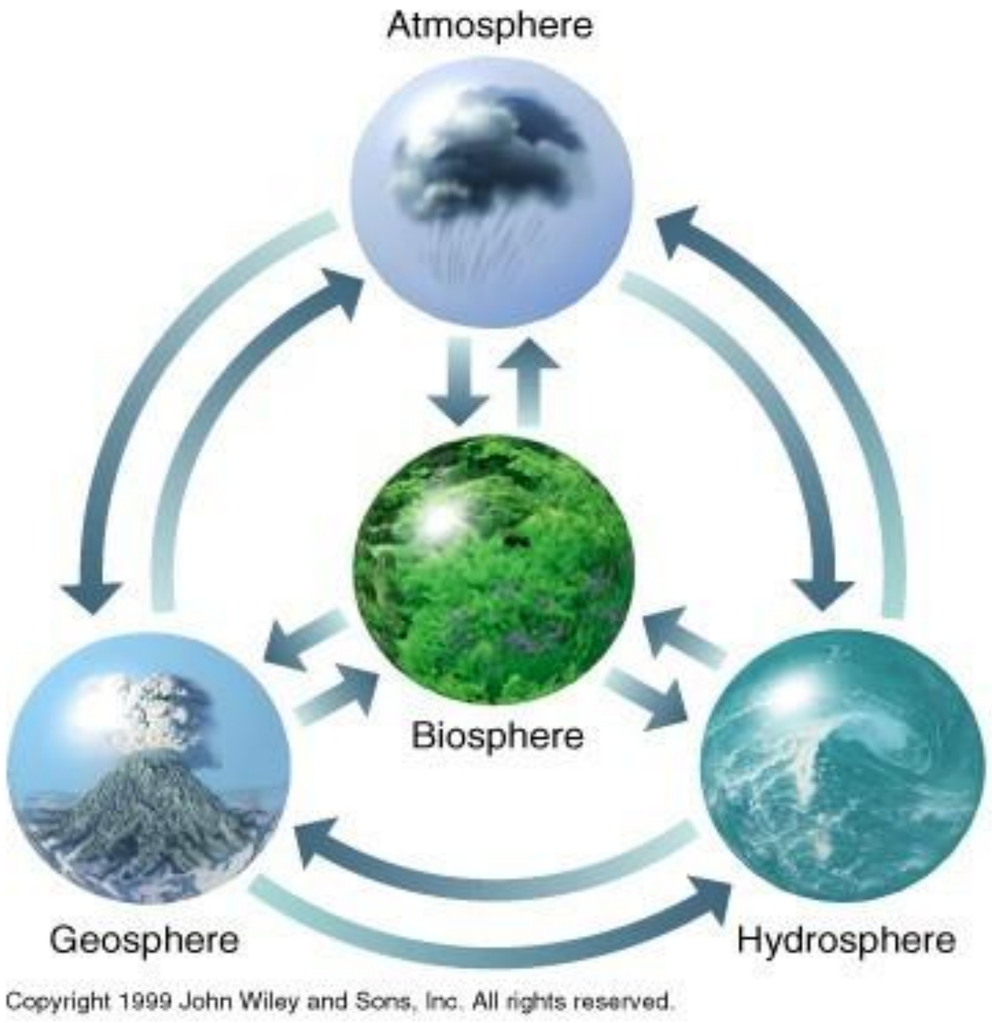
Vertical Structure of the Atmosphere



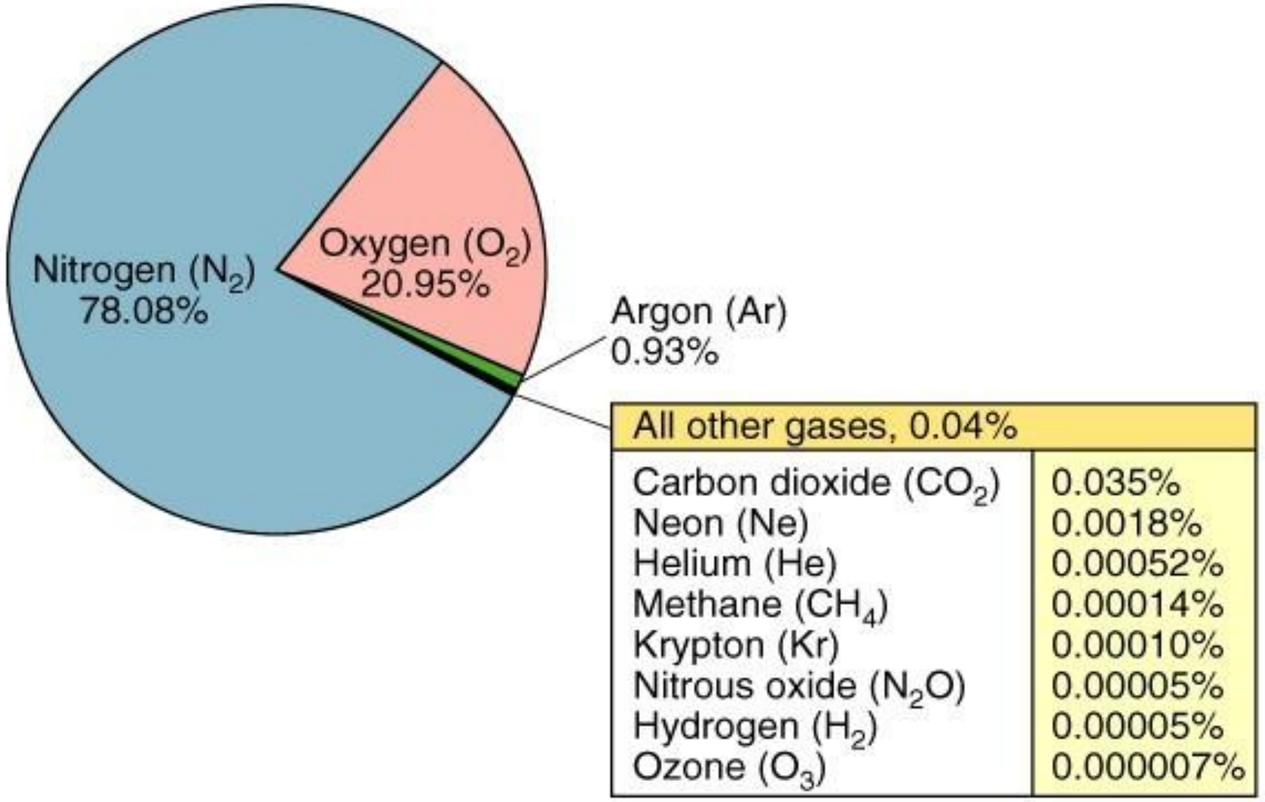
Atmosphere


The atmosphere is the blanket of air that surrounds the Earth.

Earth system



Composition of the Air



Nitrogen	78%
Oxygen	21%
Other gases	1%

*greenhouse gases: carbon dioxide, water vapor, methane, etc.

Reference Videos

See You at Next Class!!!!