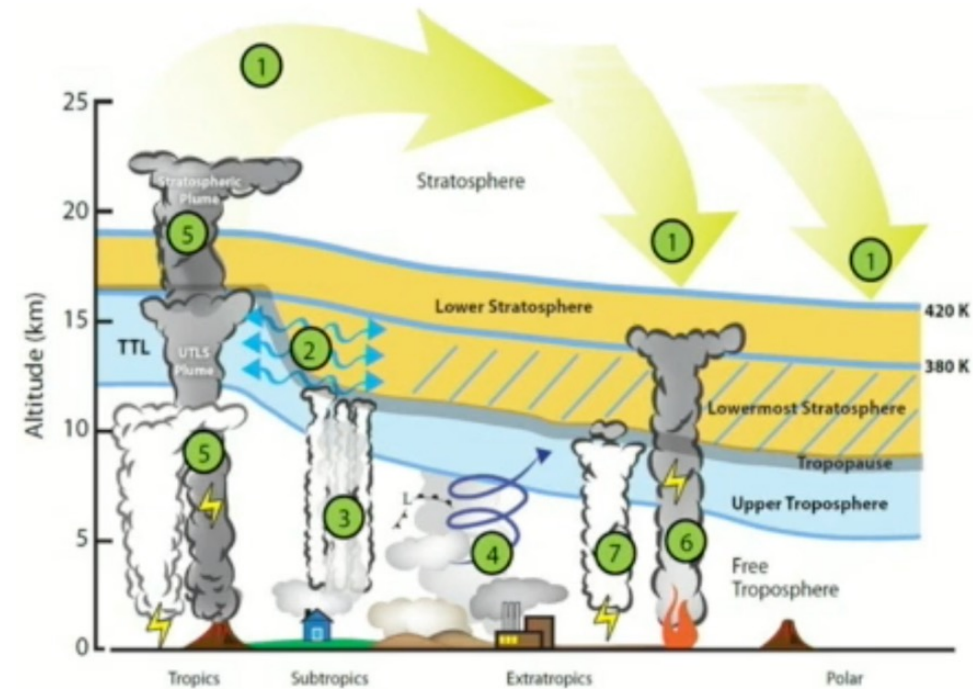
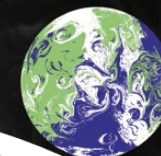


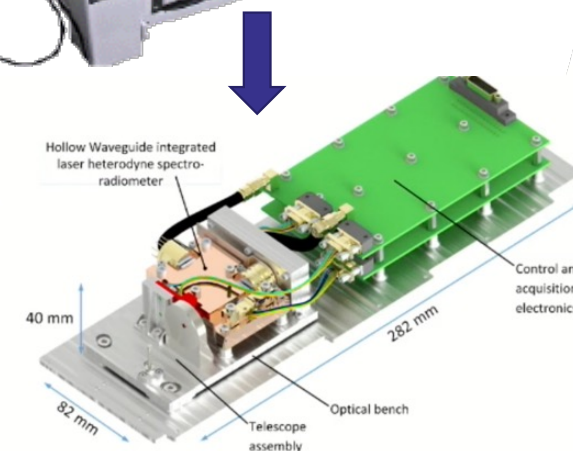


- By studying changes in the chemistry of the atmosphere, it is possible to gain knowledge of climate effects and impacts
  - Changes in water vapour affect surface temperatures and the water cycle.
  - Changes in ozone affect UV exposure and so health .
  - Measurements of the main greenhouse gases, including carbon dioxide, contribute to the overall greenhouse gas observing system
- We use space instruments to study gases in the atmosphere, but until now, these have been large, complex and expensive.





- With support from CEOI and UKSA, RAL Space has developed a novel instrument known as the Laser Heterodyne Radiometer (LHR)
- They have miniaturized it so that it fits into a small modular spacecraft known as a CubeSat.
- Several spacecraft can now be deployed in a constellation, increasing the potential scientific impact of future missions.
- It will be flown for the first time on the ESA Scout mission, CubeMAP



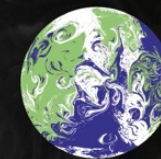
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# SPACE CLIMATE

## Measuring Climate Effects in the Atmosphere: CubeMAP



TOGETHER  
FOR OUR  
PLANET



- After more than 10 years of development at RAL Space (supported by CEOI and UKSA), the Laser Heterodyne Spectro-Radiometer (LHR) is ready to fly on CubeMAP, an ESA Scout mission to measure climate feedbacks and impact of emissions in the middle atmosphere.
- Each spacecraft will carry a miniaturized LHR and a solar disc imager. The LHR will look through the atmosphere at the Sun, giving high vertical resolution measurements of the atmospheric chemical composition.
- The CubeMap mission will be a constellation of 3 CubeSats built by Danish company Gomspace.

More information



Centre for  
EO Instrumentation



GOMSPACE



Science and  
Technology  
Facilities Council

RAL Space

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