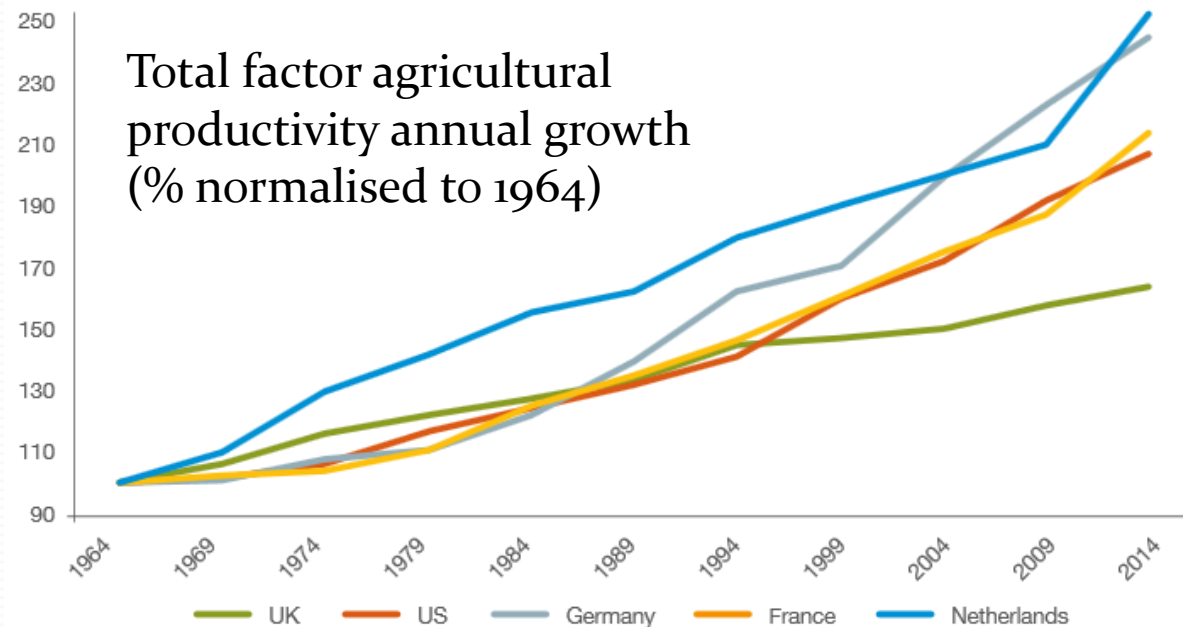# Agri-Lidar
NEO Conference
5th September 2018

ThalesAlenia
Space
a Thales / Leonardo company

The Challenge

- By 2050 agricultural output of the world needs to improve globally by 60% to feed an additional 2.4 billion people.
- UK agri-tech currently contributes £14.3bn to UK economy, but UK farmers are losing competitiveness to other developed countries.

Total factor agricultural productivity annual growth (% normalised to 1964)

Legend: UK, US, Germany, France, Netherlands

UK agricultural efficiency has grown by only 60%, compared to 150% for Germany and the Netherlands

Sources

https://ahdb.org.uk/documents/Horizon_Driving%20Productivity_Jan2018.pdf
https://www.gov.uk/government/news/business-secretary-calls-for-new-tech-revolution-in-agriculture
http://www.bbc.com/news/uk-england-birmingham-42724629

One Solution

- **Agri-LIDAR**
- increase the productivity of the farming sector of the UK and beyond to help meet the great food challenges of the 21st century.
  - delivering usable intelligence to farmers to improve and speed up decision making.
  - Represent a potentially significant export opportunity.
  - Agri-LIDAR operates at local night, and targets <10m resolution, making it complementary to ESA's FLEX which operates during local day and 300m resolution.

S. Ombinda-Lemboumba, "Laser Indusced Chlorophyll Fluorescence of Plat Material." Dec 2006
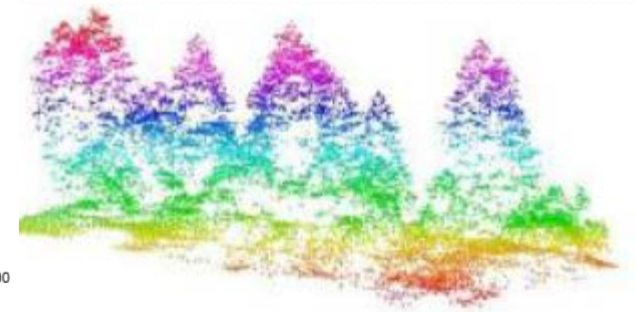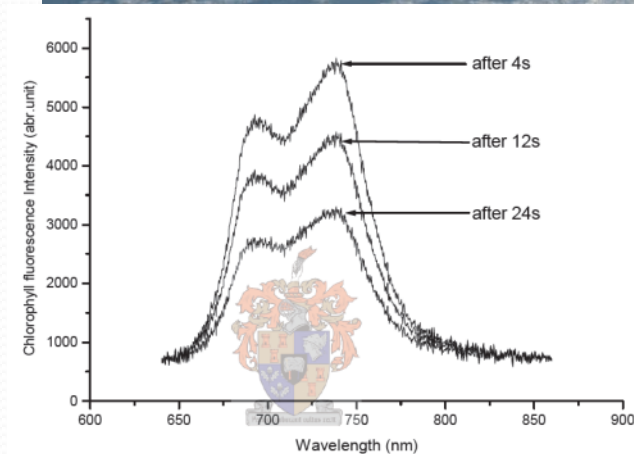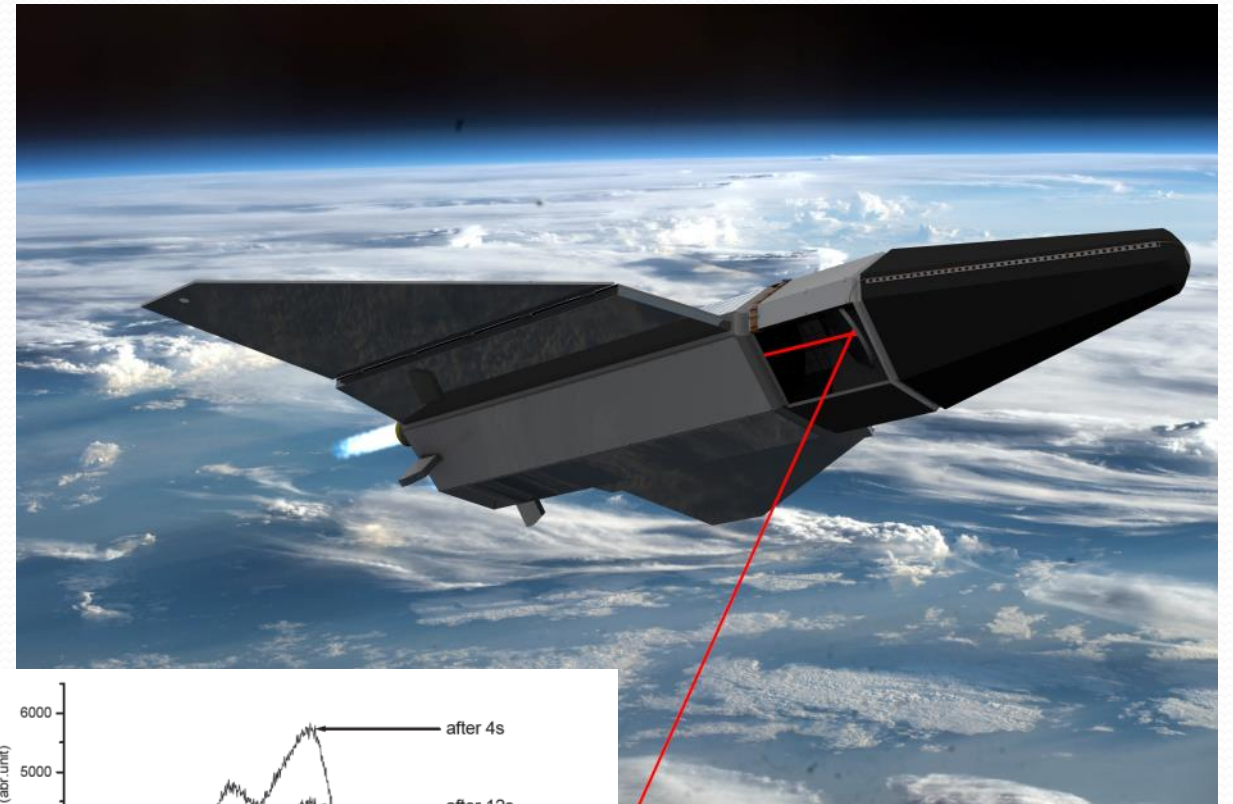
The Skimsat Platform

- **Operating in VLEO (sub 260km)**
- No orbital debris
- Design, build, test, launch and operation from the UK
- 10x* reduction in cost
- Autonomous drag compensation to provide 3 years of life
- Designed for constellations and small launchers.
- Potential for EO, Navigation and Telecom payloads

*against 620km satellite

S. Ombinda-Lemboumba, "Laser Indusced Chlorophyll Fluorescence of Plat Material." Dec 2006
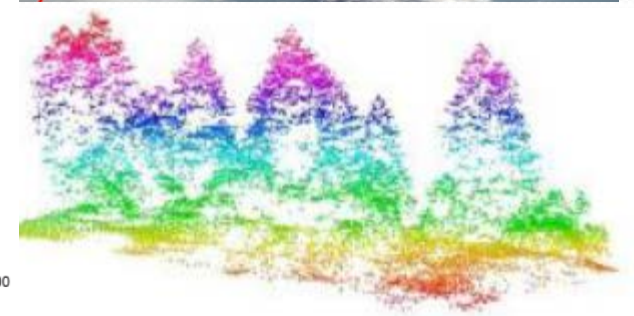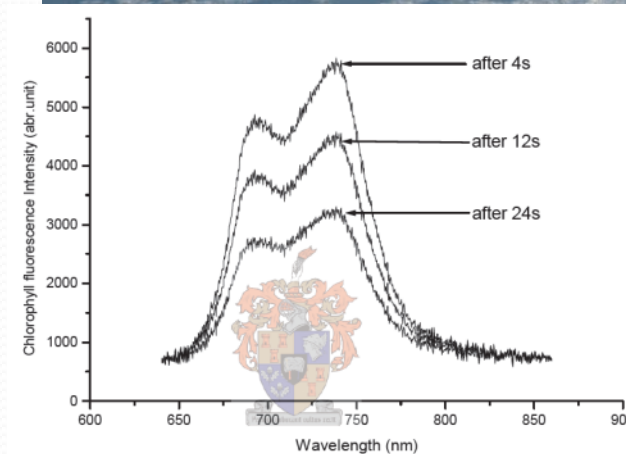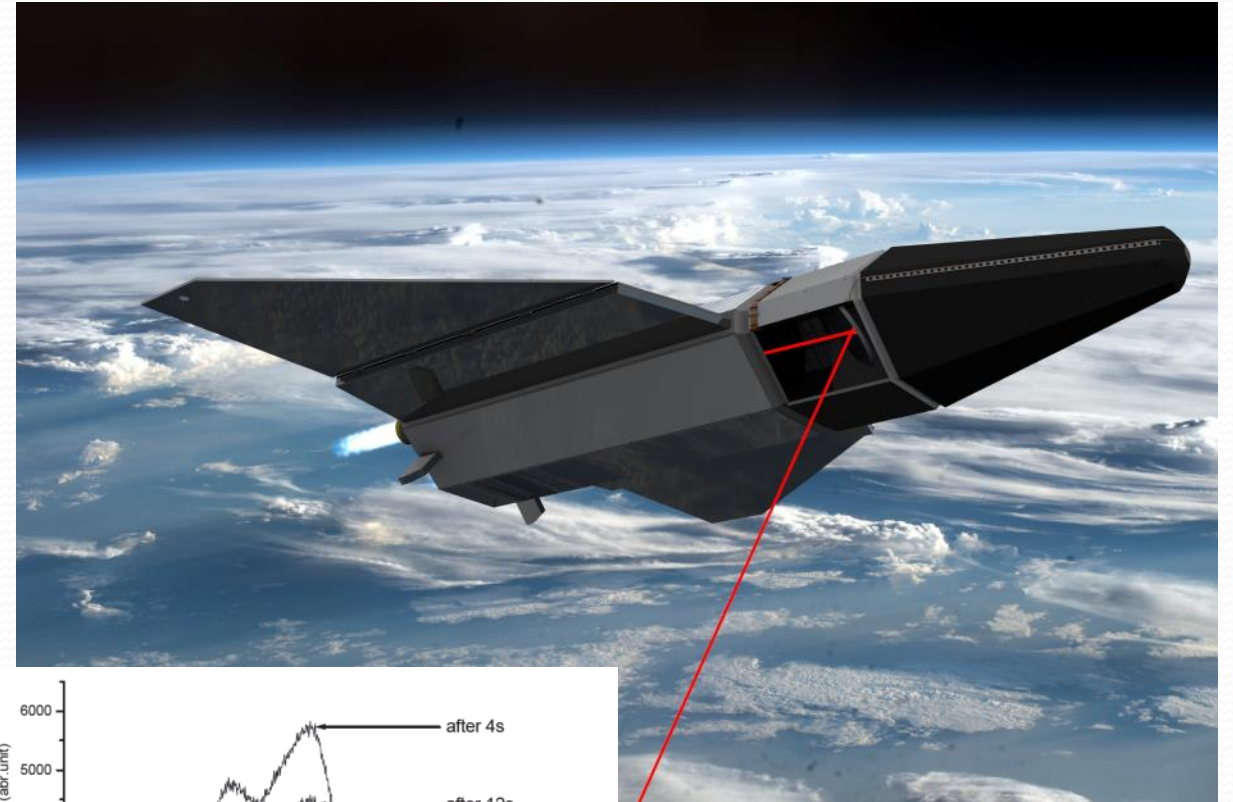
Wide Ranging Benefits

- Creation of a unique high resolution crop health data set, complemented by other resolution scales from hand held scanners, UAV's and ESA's FLEX mission.
  - This data will be used to save crops before they are lost, and to repair recurring issues such as drainage and pesticide use.
- Local, regional and global level census of crop yields, helping to spot growing trends, track disease and identify misreporting.
- Secondary applications include detection of illegal logging and coral reef monitoring.
- Deploying an Agri-LIDAR on a satellite greatly increases its reach, reduces the complexity to the user and allows for cross-calibration with other space sensors.