

NEOC 2018

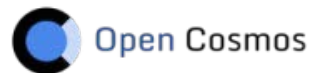
UVS  T

# LOOKING AFTER THE FUTURE

A LOW-COST UV-VIS CUBESAT FOR  
AIR QUALITY ASSESSMENTS



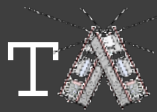
UNIVERSITY OF  
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**AIR POLLUTION AFFECTS 92% OF  
PEOPLE GLOBALLY, CAUSES THREE  
MILLION PREMATURE DEATHS AND  
COSTS \$3-5 TRILLION PER YEAR\***

\*WHO figures (2006)  
Image source: the World Health Organization

The number of annual deaths caused by pollution greater than malaria and HIV combined



▲ Heavy smog in the Lujiazui financial district of Shanghai. Photograph: Corbis

## Air Pollution Endangering Tens Of Thousands Of London Children, Study Finds



TOBY MELVILLE / REUTERS  
Tens of thousands of children in a quarter of all London's schools are exposed to illegal levels of air pollution

London mayor [Sadiq Khan](#), who commissioned the report, vowed to tackle air pollution, which is also linked to heart and lung diseases.

## Health risks of shipping pollution have been 'underestimated'

One giant container ship can emit almost the same amount of cancer and asthma-causing chemicals as 50m cars, study finds

● Climate change threatens 50 years of progress in global health, study says



▲ 90,000 cargo ships travel the world's oceans. Photograph: Peter Maenhoudt/AP

## How 16 ships create as much pollution as all the cars in the world

By [FRED PEARCE](#)

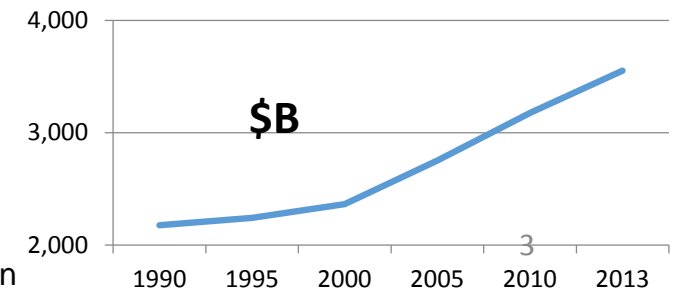
## Dirty diesel: why ships are the worst offenders

Ships belch out most of their sulphurous toxins far from land, but they could still be responsible for 60,000 deaths each year



▲ Black smoke pours from a ship's funnel. Photograph: Alamy

“ When two or three 50,000-tonne ships go by in one night, it is the equivalent of having an entire power station floating past us, with all the emissions that entails ”



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# TACKLING THE PROBLEM



World Health Organization



AIR & WASTE MANAGEMENT ASSOCIATION  
SINCE 1907



European Environment Agency



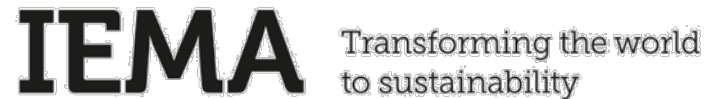
CENTRE FOR ENVIRONMENTAL HEALTH



POLLUTION MANAGEMENT & ENVIRONMENTAL HEALTH



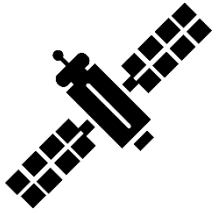
Department for Transport



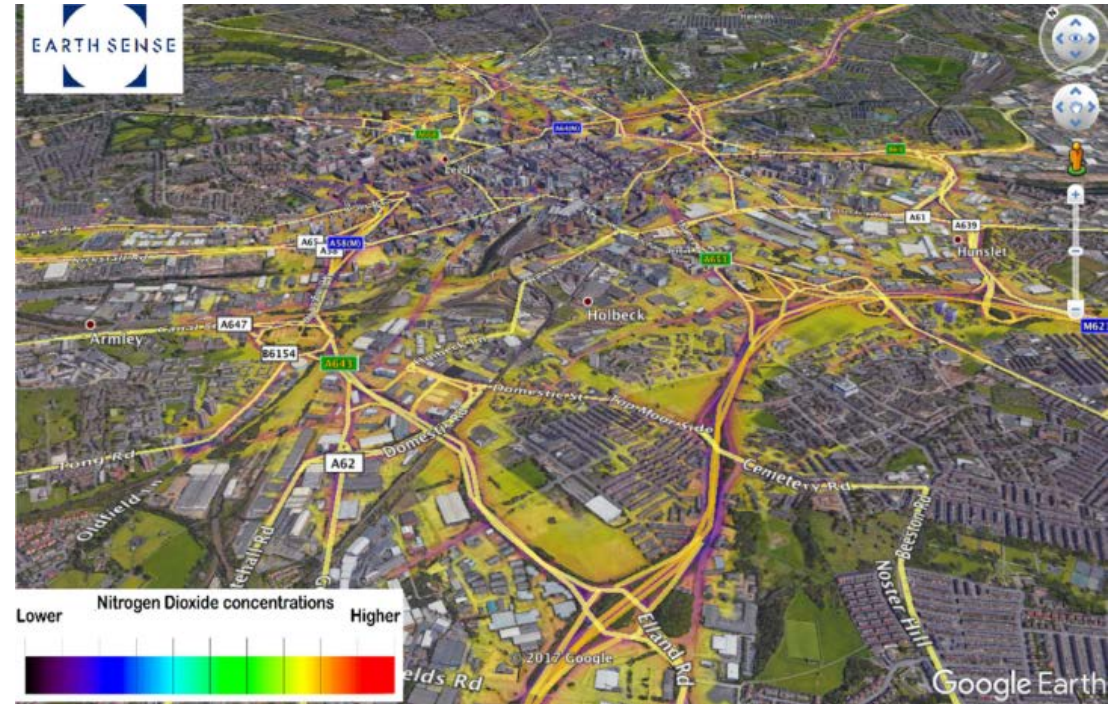
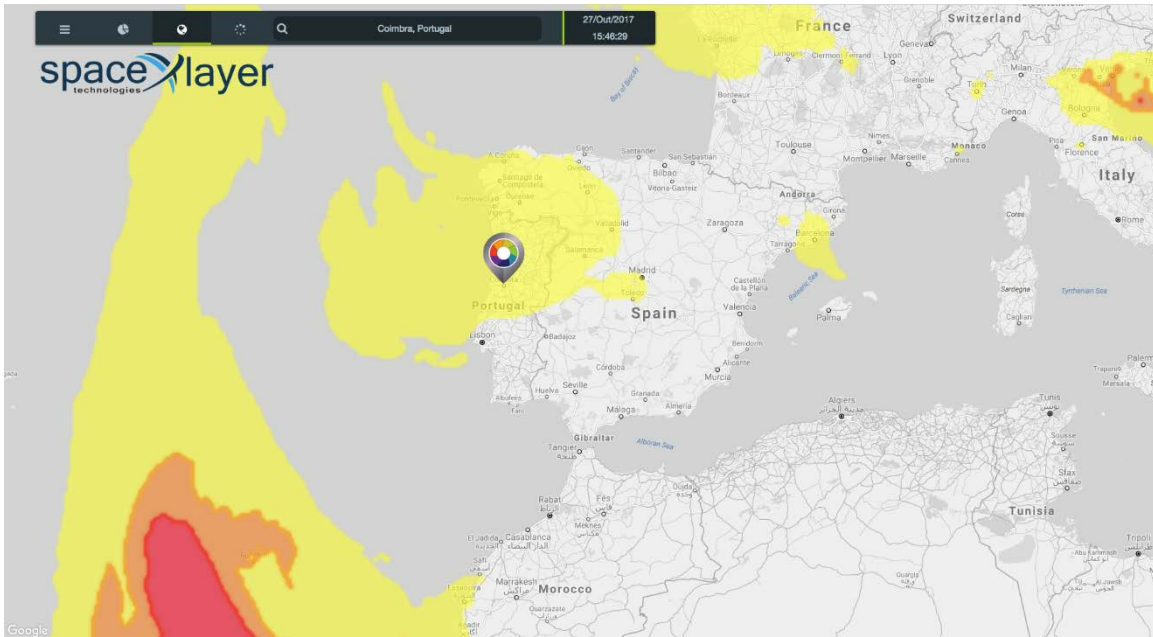


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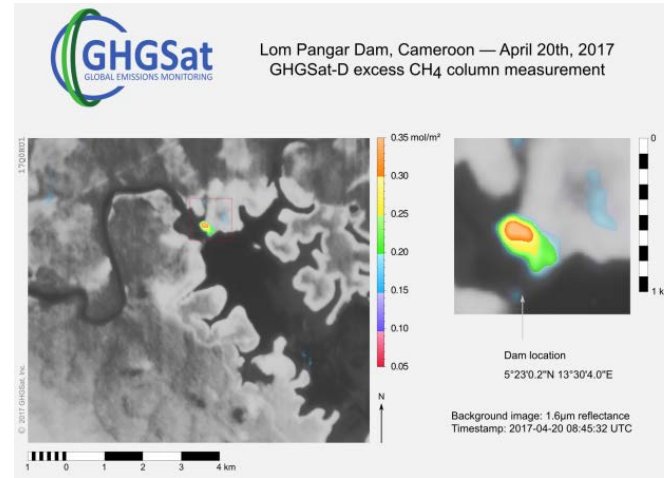
# NEW APPLICATIONS



e.  
g.



Offline historic datasets.  
 Asia / South America poor  
 revisit times



NOT available:

- Global revisit times
- <2-3h latency

NOT possible:

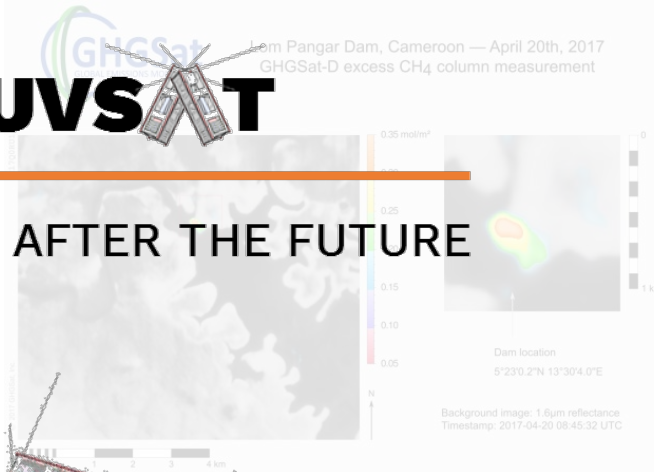
- Near-real time applications
- Shipping pollution
- Nation-wide air quality monitoring
- Urban pollution warning
- Pollution surveillance
- Disaster response
- Algal bloom tracking

Offline historic datasets.

Asia / South America poor revisit times

## UVSAT

### LOOKING AFTER THE FUTURE



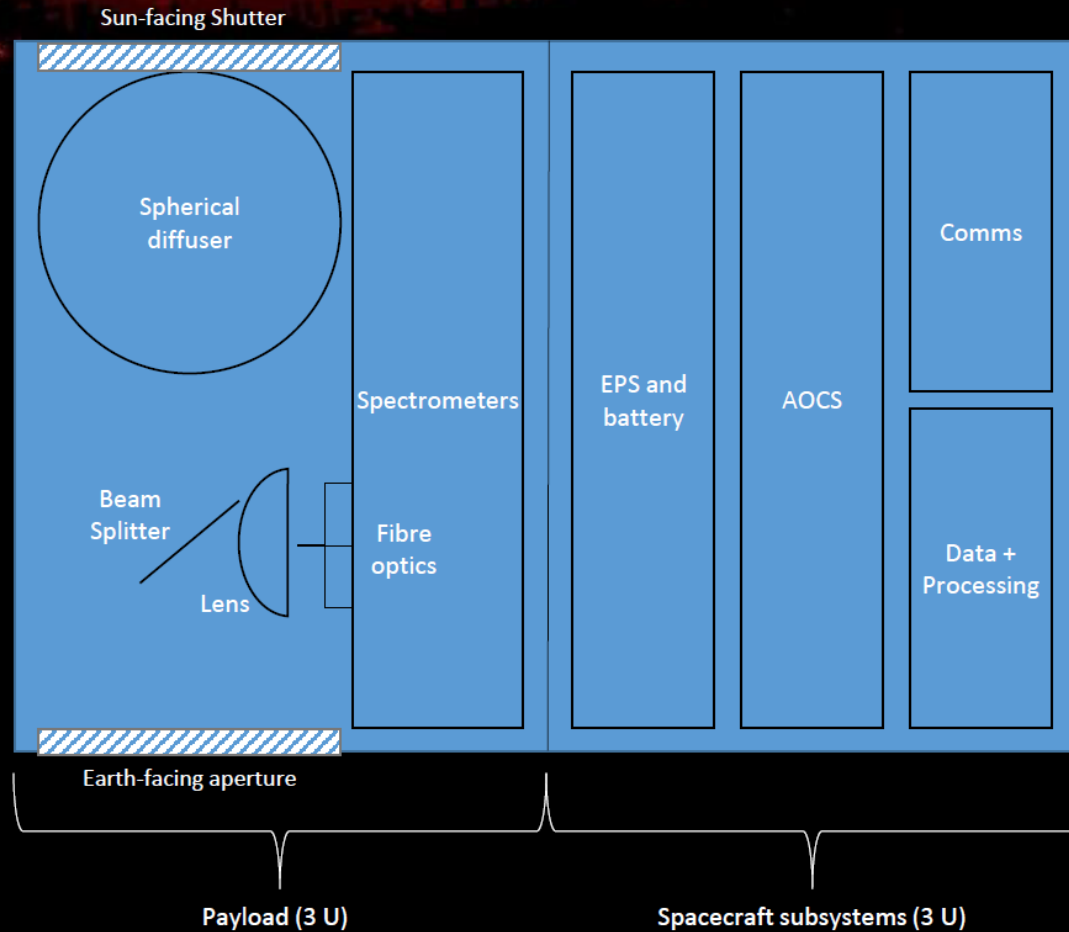
NOT available:

Offline revisit times

Latency

- Near-real time applications
- Shipping pollution
- Nation-wide air quality monitoring
- Urban pollution warning
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- Disaster response
- Algal bloom tracking



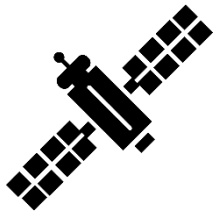


## UVSAT constellation:

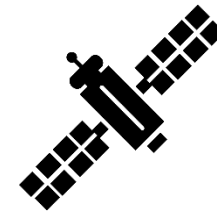
- Compact UV-VIS OTS Spectrometres
  - novel hardware required-
- <1h revisit times
- New <1h latency applications
- Tailored data products



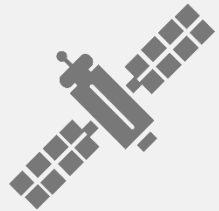
## FILLING THE INFORMATION GAPS



**Sentinel 5** - global but  
only once a day, same  
time



**Sentinel 4**  
geostationery, non-  
global coverage 24/7  
2022




**UVSAT** - complementary dataset  
Global  
Sub-hour temporal resolution  
Sub-hour latency

New real-time applications

## INFORMATION GAPS



**Sentinel 4**  
geostationery, non-  
global coverage 24/7  
2022

UVS  T

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LOOKING AFTER THE FUTURE