Finnish Centre of Excellence in Research of Sustainable Space

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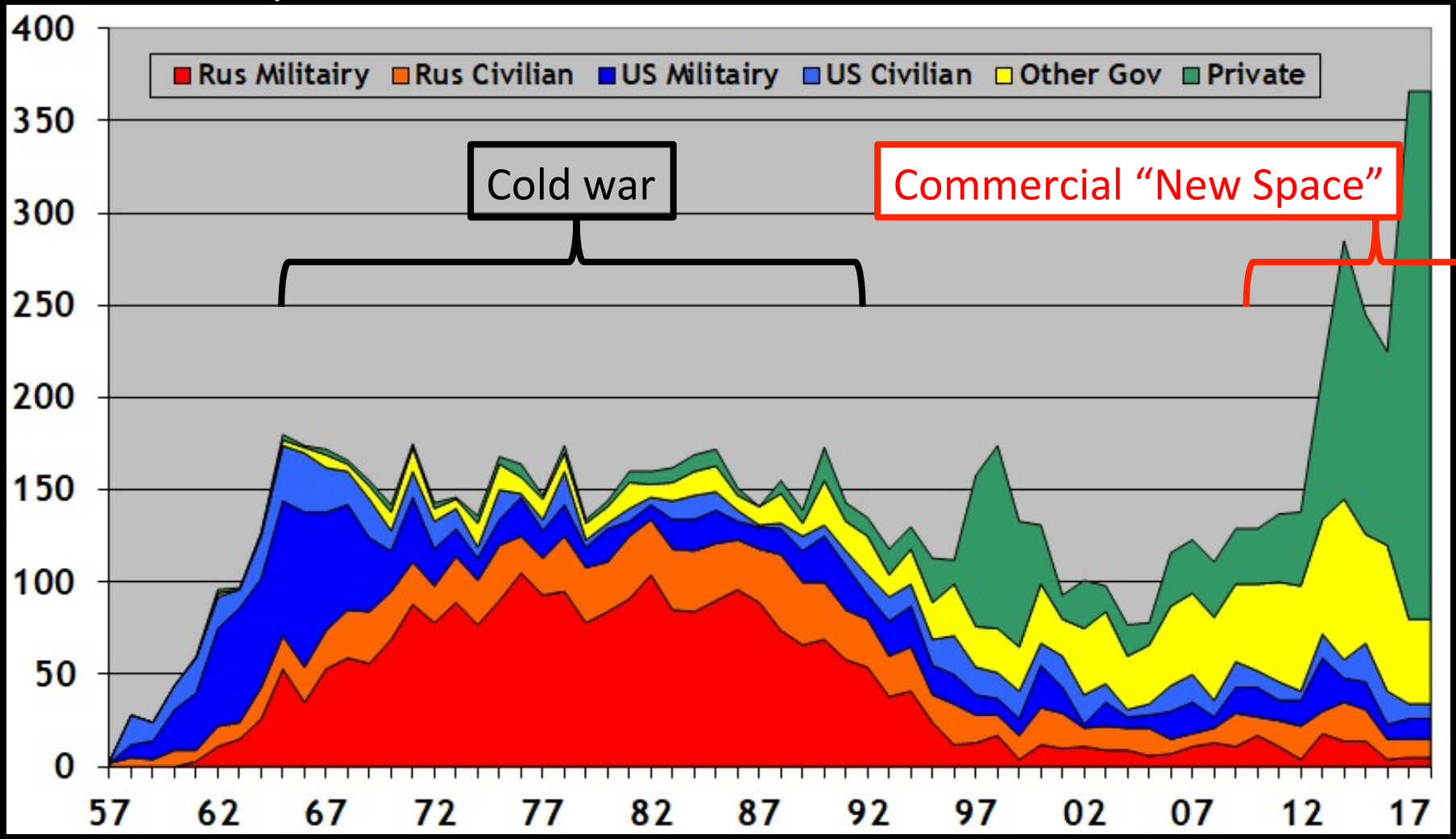
Finnish satellite workshop, Espoo, 17-18 Jan, 2018

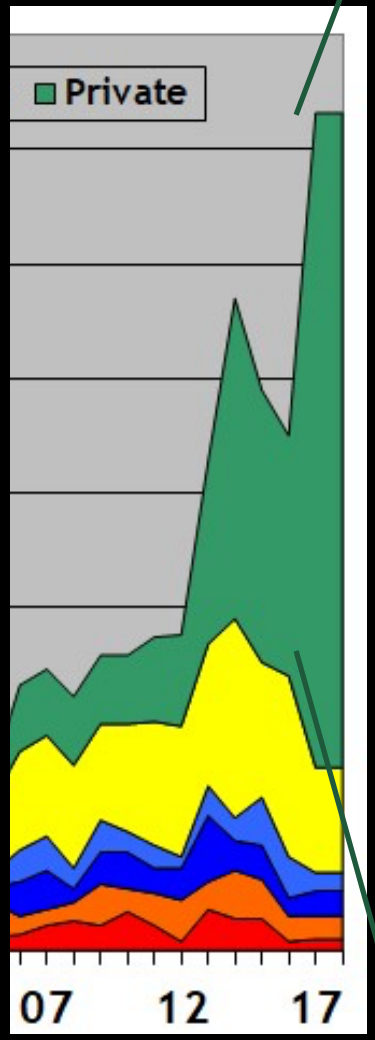
@cleanorbits

Emerging megatrend

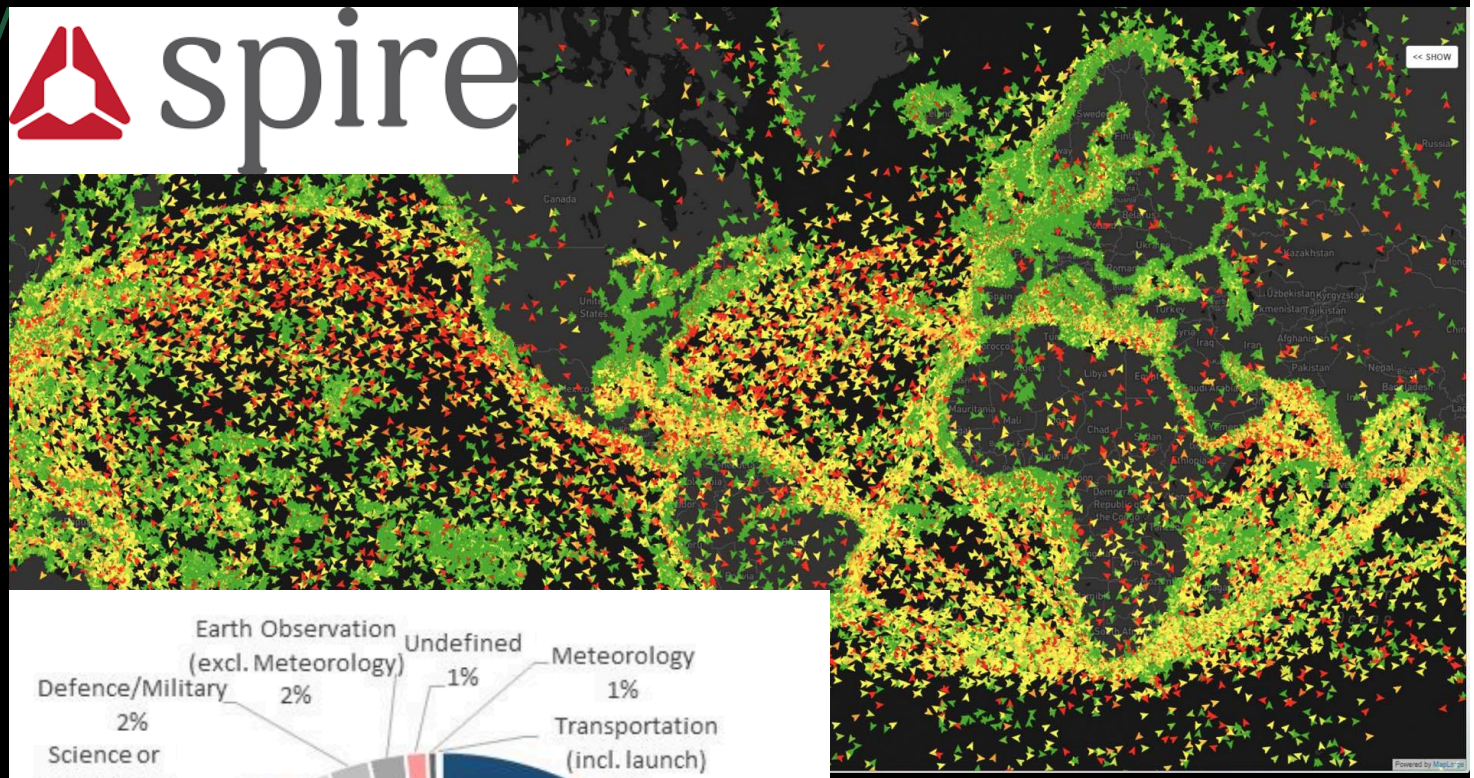
Number of new spacecraft

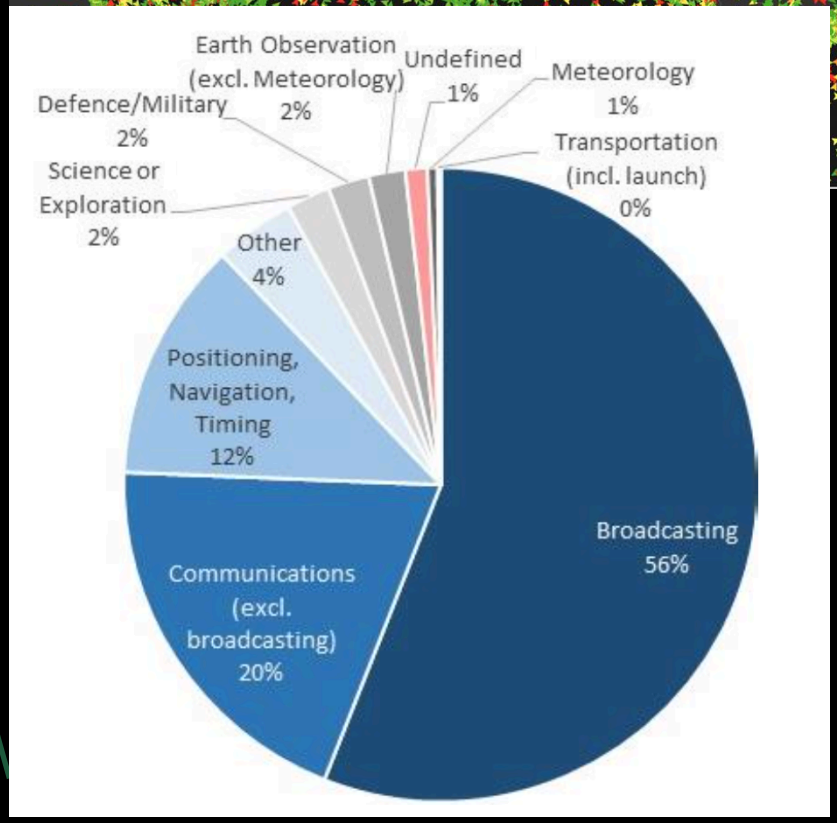


Spacecraft Encyclopedia/ http://claudelafleur.qc.ca
http://spaceworksforecast.com



spire





UK space industry income by capability, 2014/15

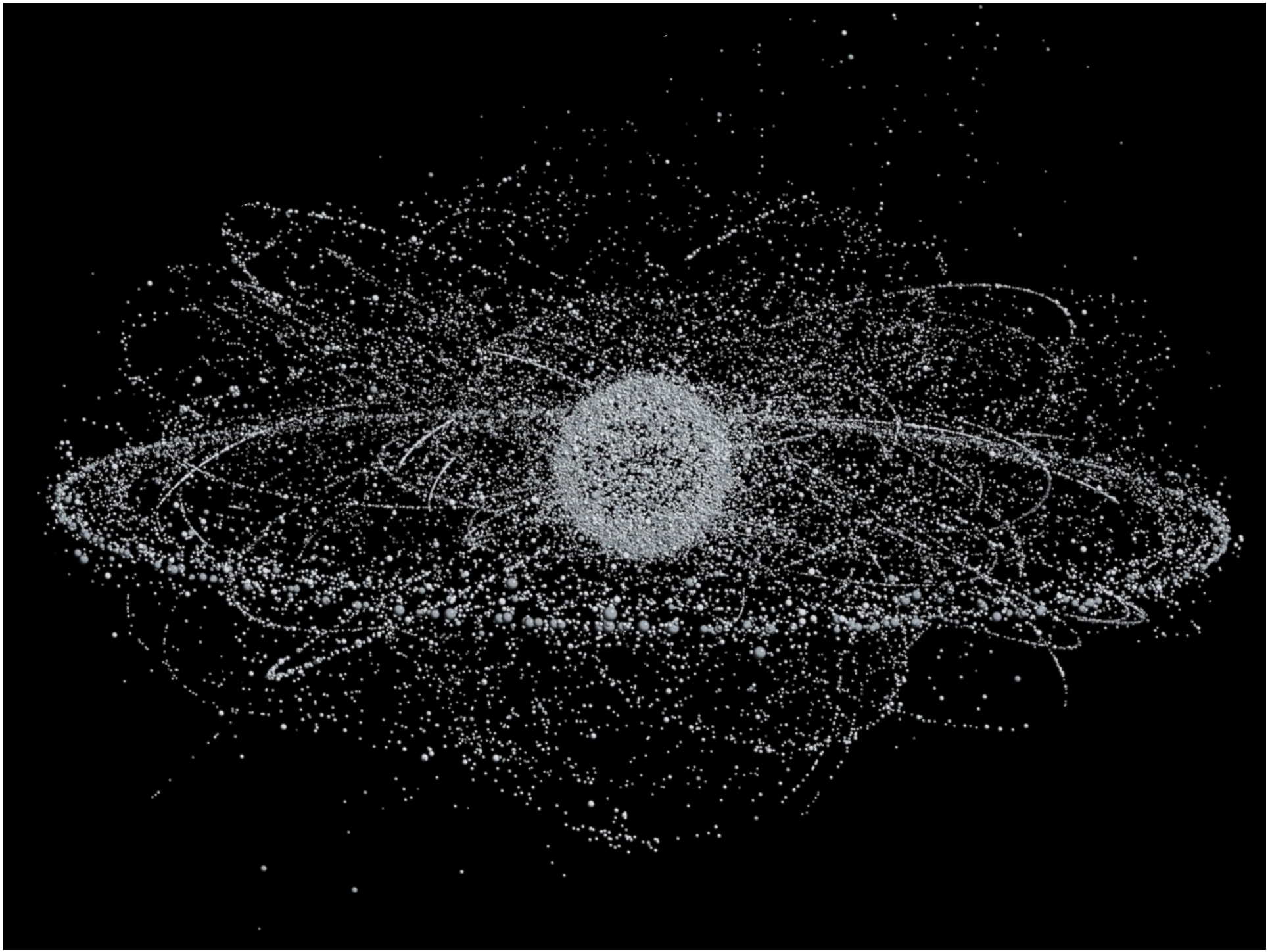

Goldman
Sachs

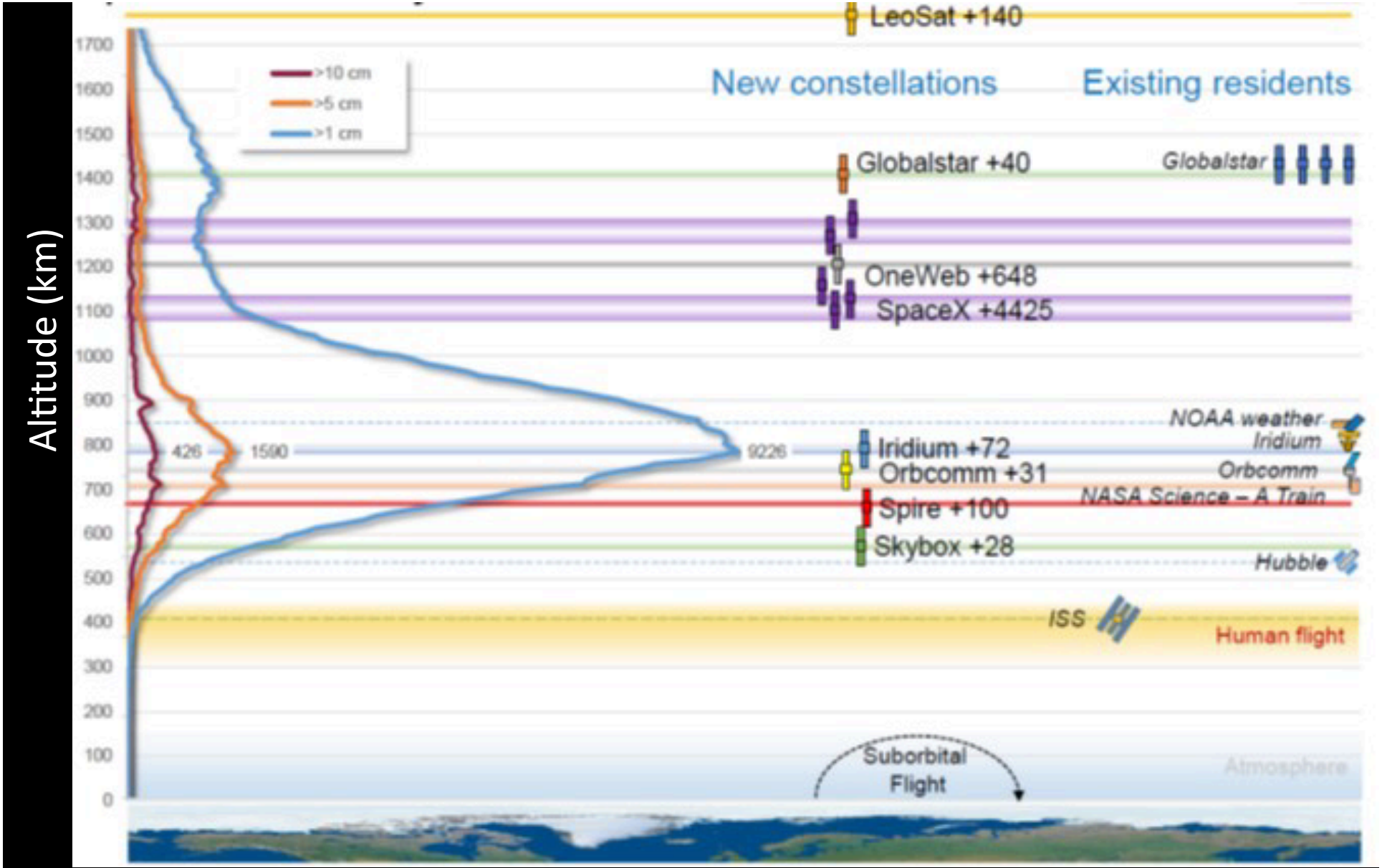
9 %


RESEARCH
AND
MARKETS
THE WORLD'S LARGEST
MARKET RESEARCH STORE

23 %


What does this mean?





Source: Aerospace Corporation, “Space Traffic Management: Can We Maintain Safe Operation in LEO?”


Number of satellites increases rapidly
Small, commercial, launched fast
Sustainable science & business?

Genes behind embryonic aneuploidy *pp. 180 & 235*

Closing the Central American Seaway early *pp. 186 & 226*

Chemical imaging of membrane lipids *p. 211*

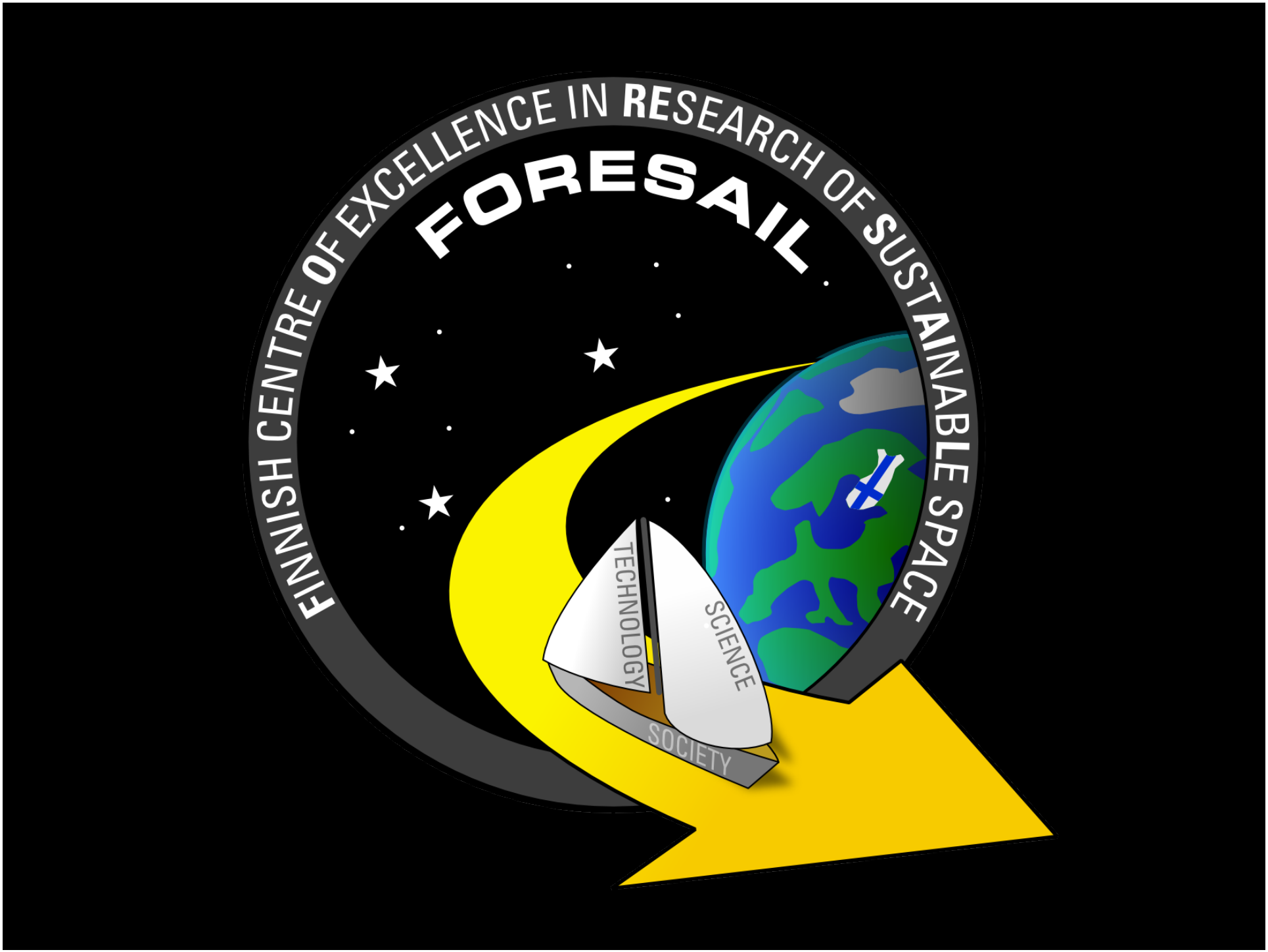
Science

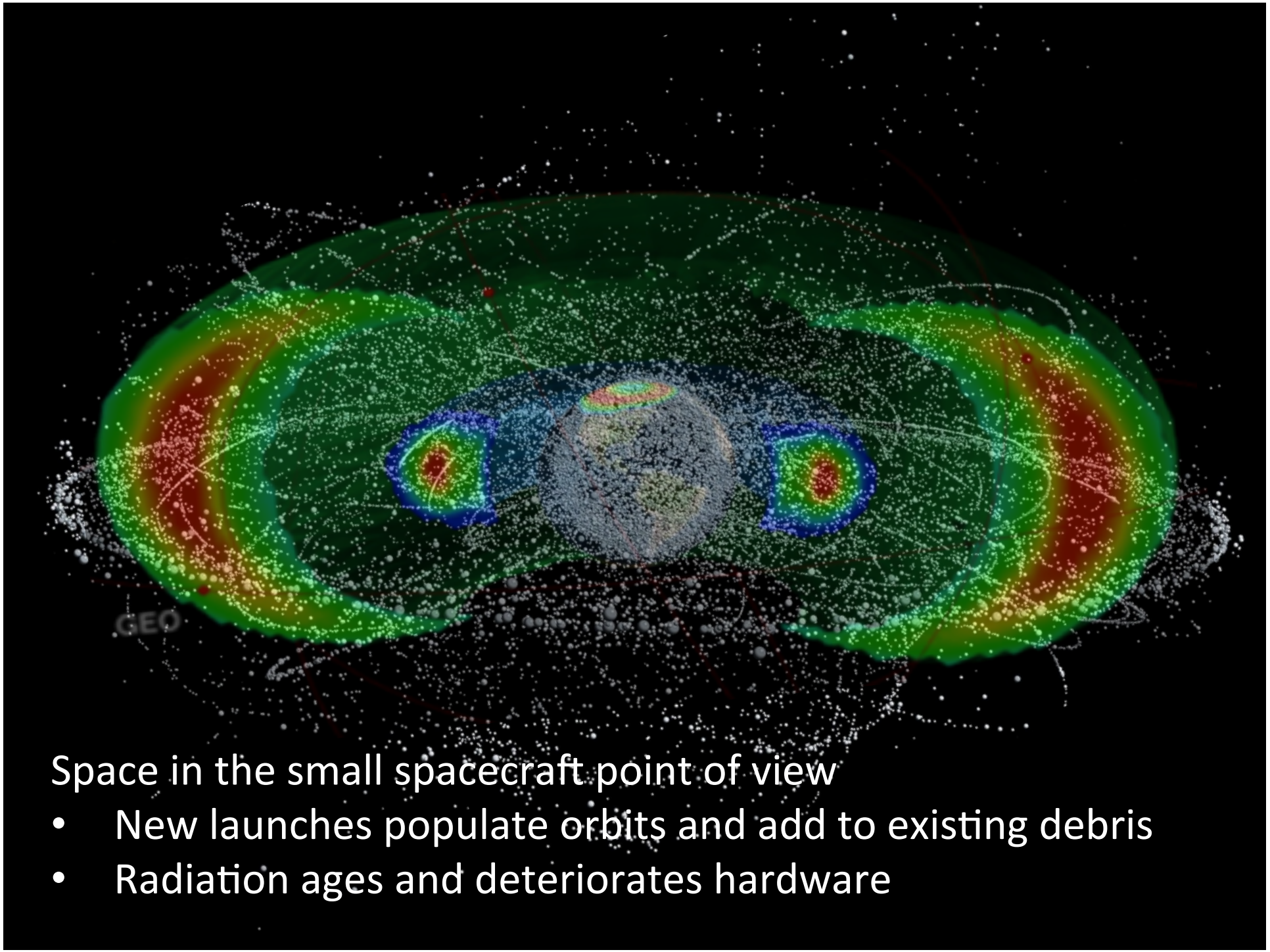
$10
10 APRIL 2015
sciencemag.org

AAAS

CubeSats take flight

Cheap, miniature satellites democratize space *p. 172*


FINNISH CENTRE OF EXCELLENCE IN RESEARCH OF SUSTAINABLE SPACE
FORESAIL
TECHNOLOGY
SCIENCE
SOCIETY

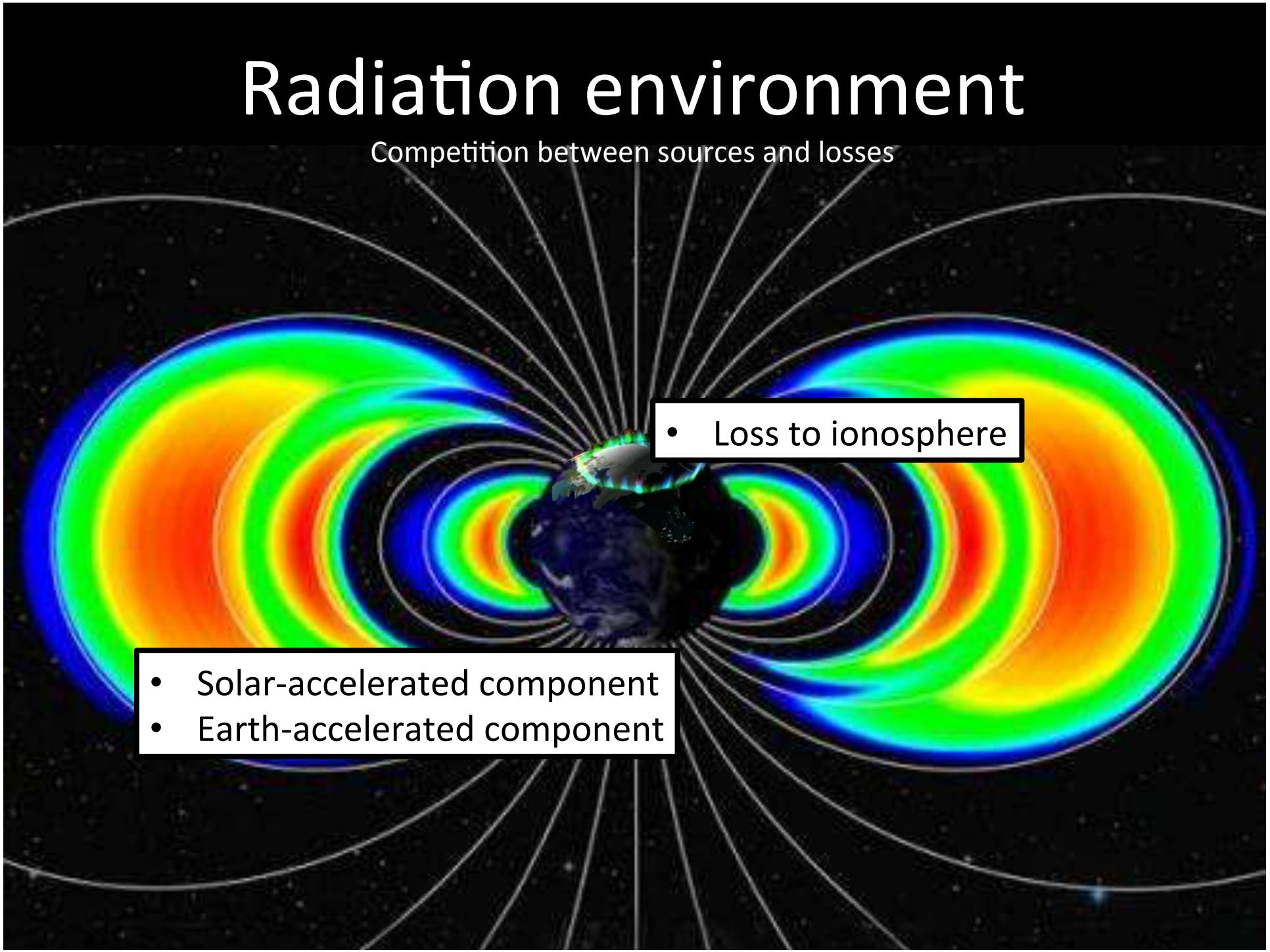


Space in the small spacecraft point of view

- New launches populate orbits and add to existing debris
- Radiation ages and deteriorates hardware

Radiation environment

Competition between sources and losses



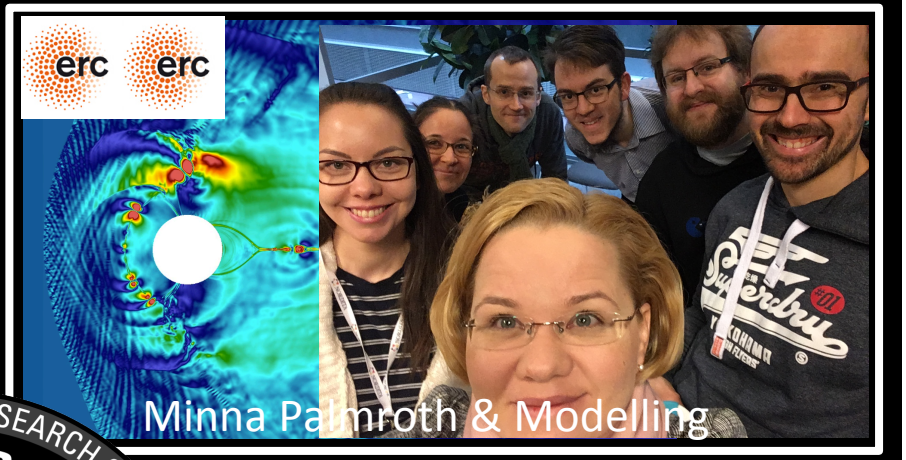
Who we are

Jaan Praks & Aalto-series platforms

FINNISH CENTRE OF EXCELLENCE IN RESEARCH OF SUSTAINABLE SPACE

FORESAIL

TECHNOLOGY SCIENCE SOCIETY

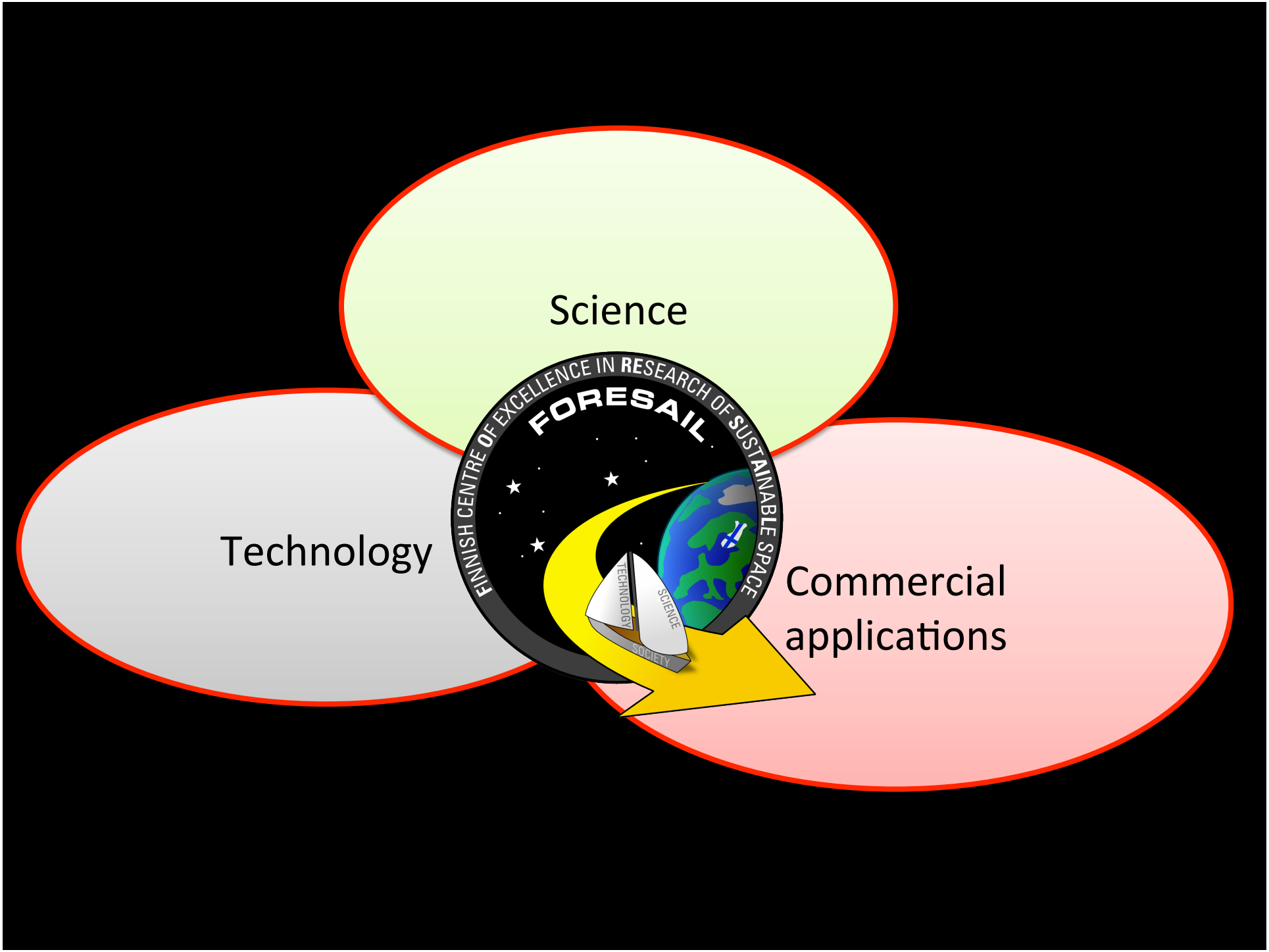


Minna Palmroth & Modelling

Emilia Kilpua & Observations

Rami Vainio & Intelligent Instruments

Pekka Janhunen & Propulsion& deorbiting


Science
Technology
Commercial applications
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SCIENCE
SOCIETY

Targets

- Understanding radiation environment
- Towards orbit safety
- Science based on nanosatellites