

Area di Ricerca del CNR
Istituto Nazionale di Astrofisica
Radio Astronomia



Bologna, 18 e 19 Maggio 2018.

SRITAC 2 - 2018 - Officine orbitali, primo livello di espansione civile nello spazio

Recupero dei Detriti e Rottami Spaziali e Scenari per il loro Riutilizzo

STEFANO ANTONETTI – D-ORBIT

78 CONSTELLATIONS: 23,000+ SATELLITES





PSLV-C37 CARTOSAT 2 S MISS

ONBOARD CAMERA

NANO SATELLITES P+ SIDE SEPARATION





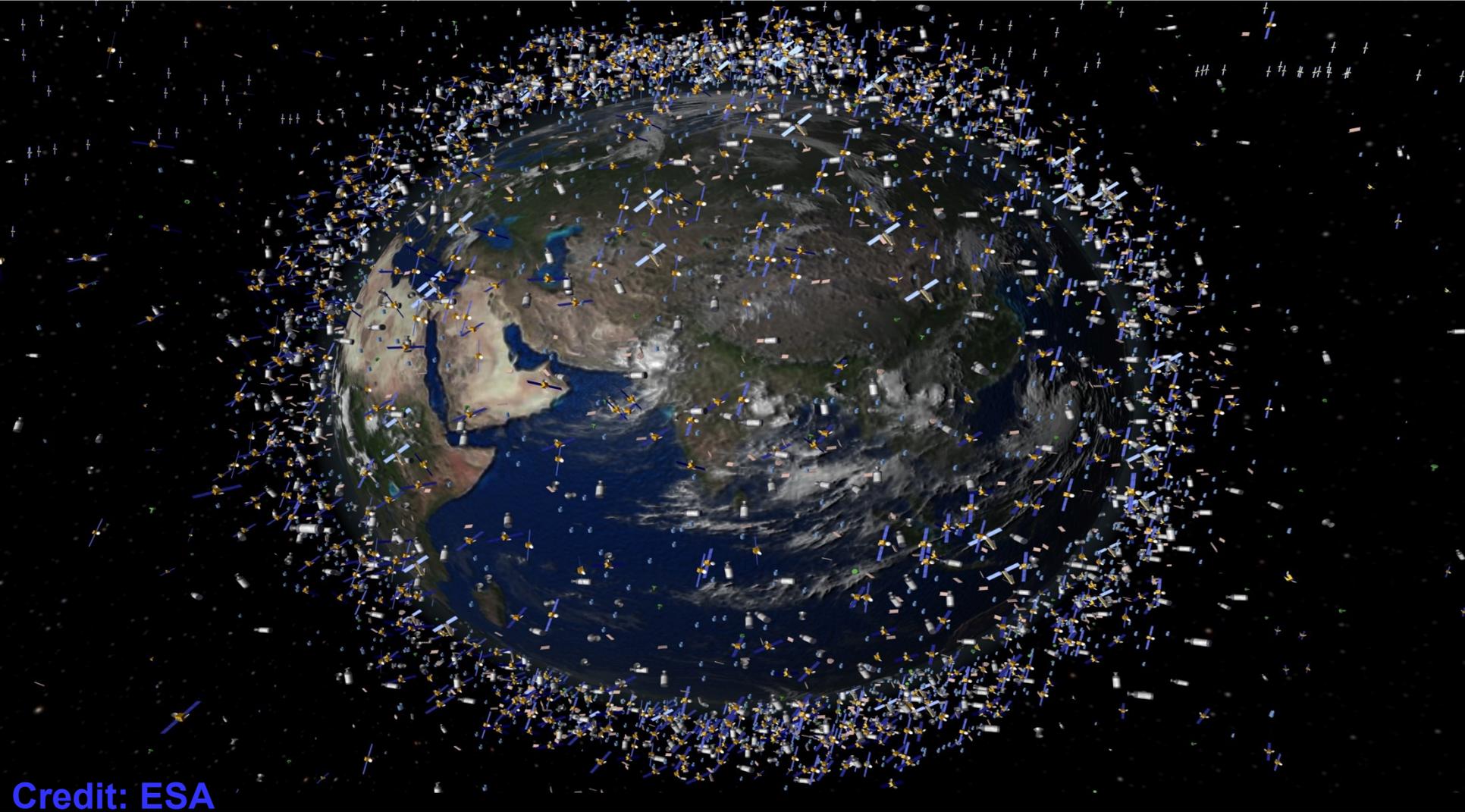


Credit: NASA

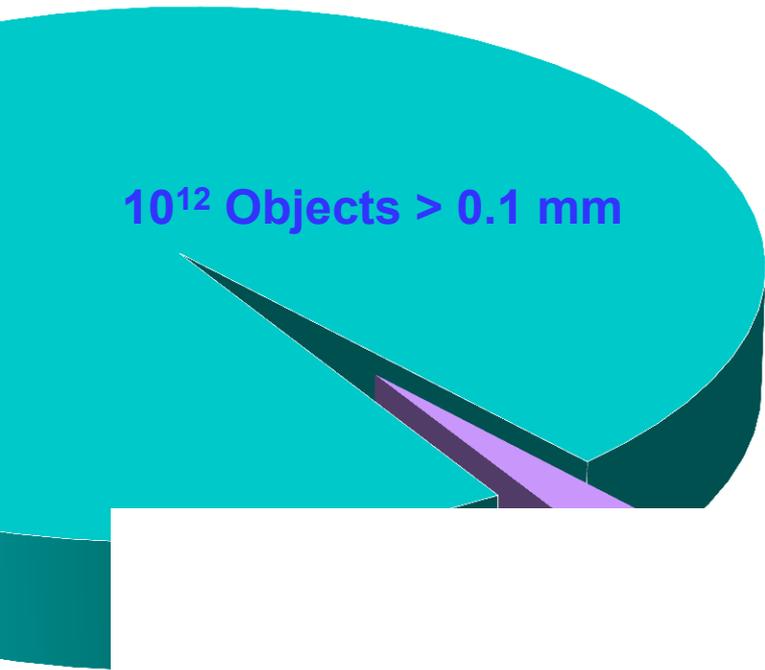
WHAT'S THE CATCH?





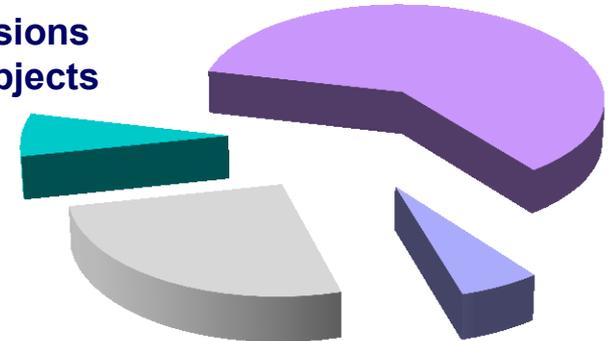


Credit: ESA

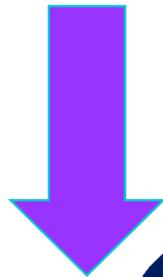


1 500 Missions
Related Objects

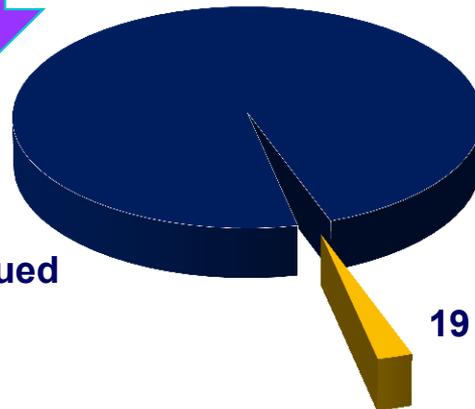
11 000 Fragments



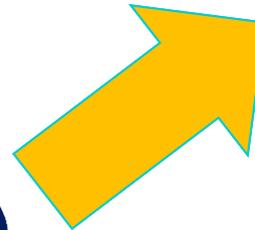
**1 750
Active
Satellites**



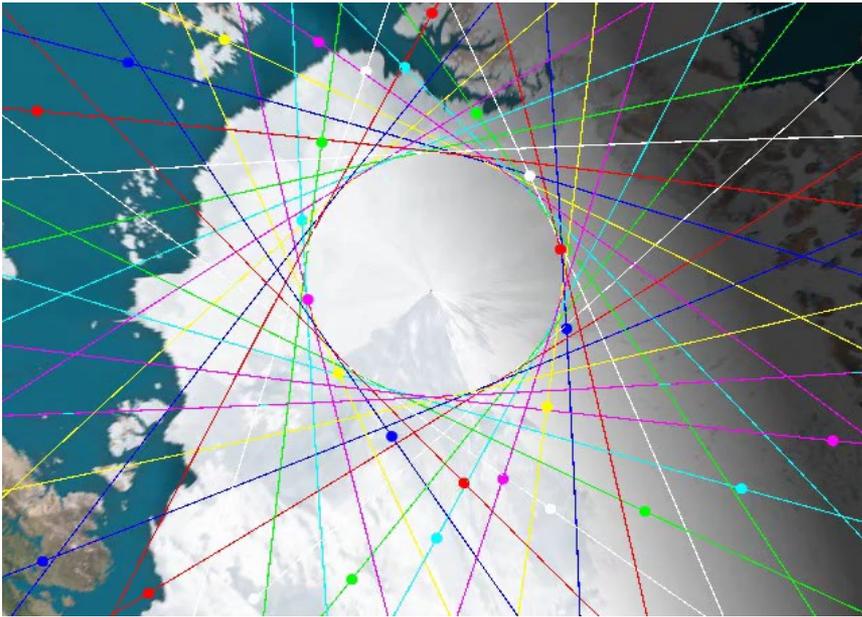
Not Catalogued



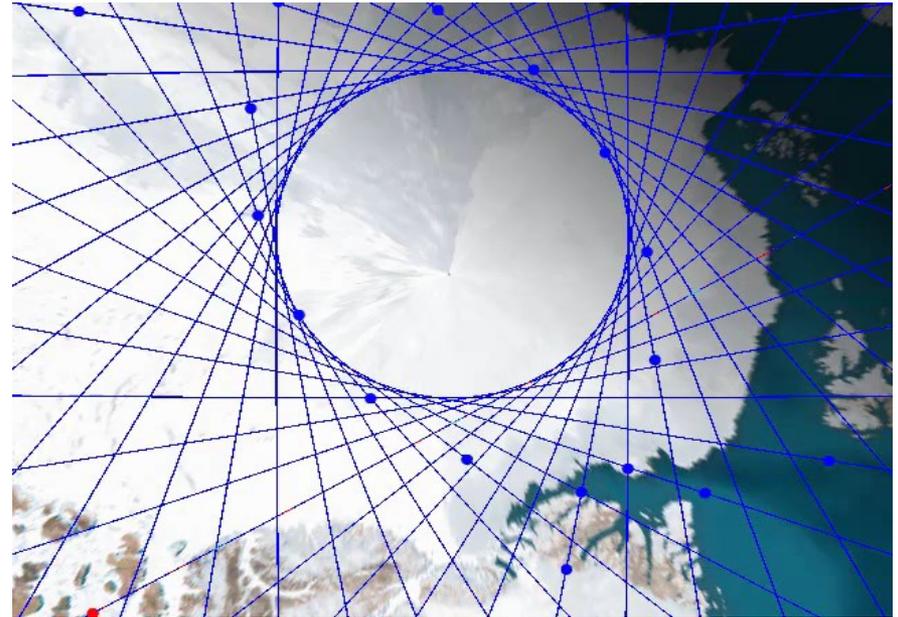
19 164 Catalogued Objects



LARGE CONSTELLATION



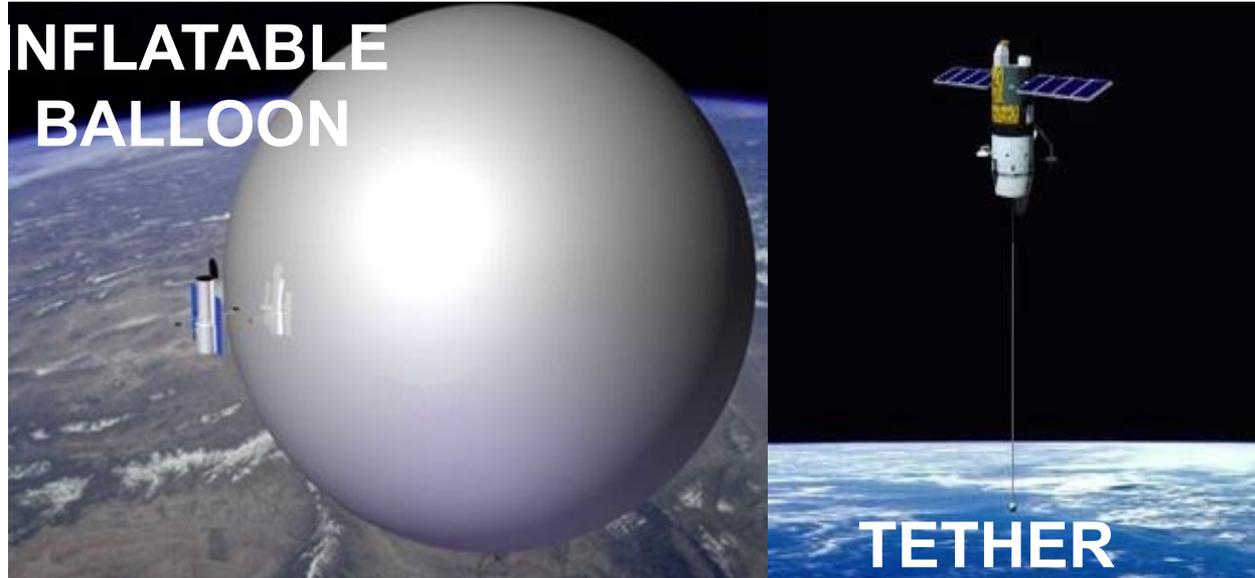
IDEAL CASE



3 DEFUNCT SATELLITES

MITIGATION

***“If you don’t know how to solve a problem,
stop causing it”***

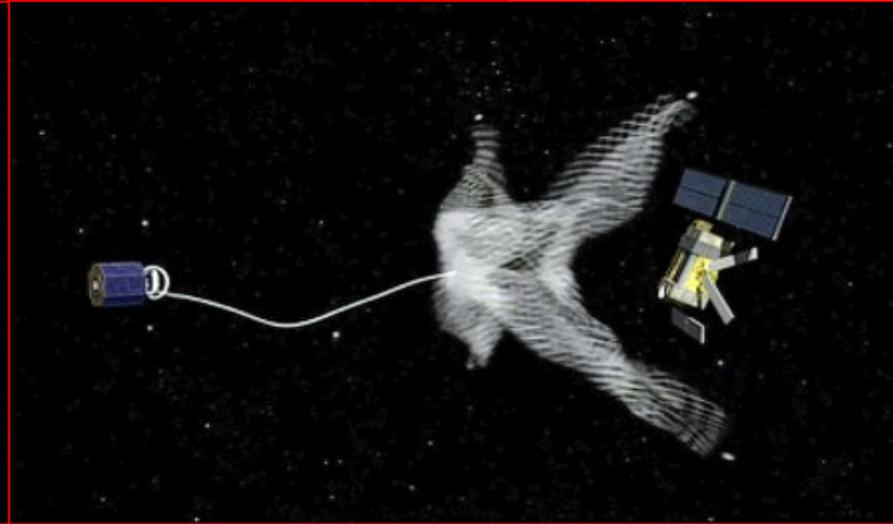
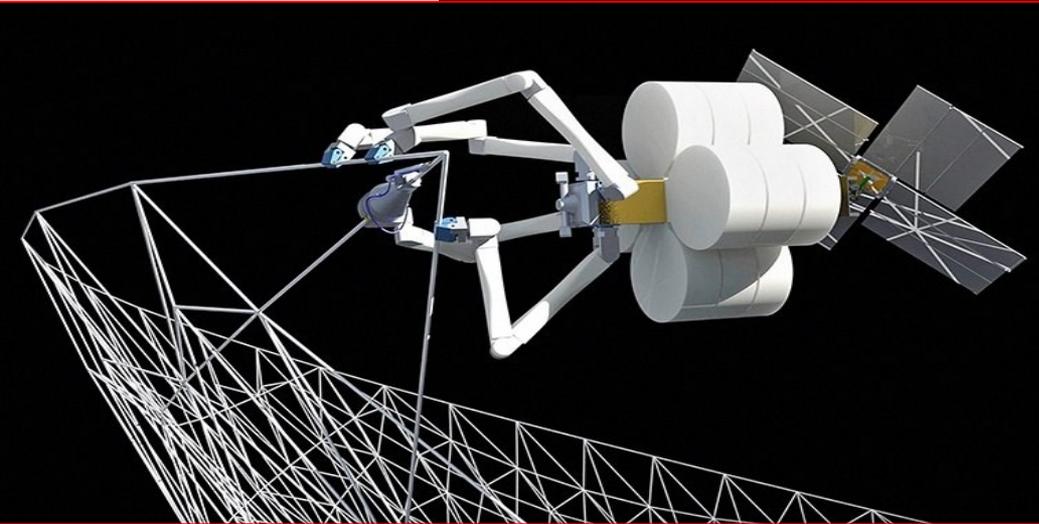
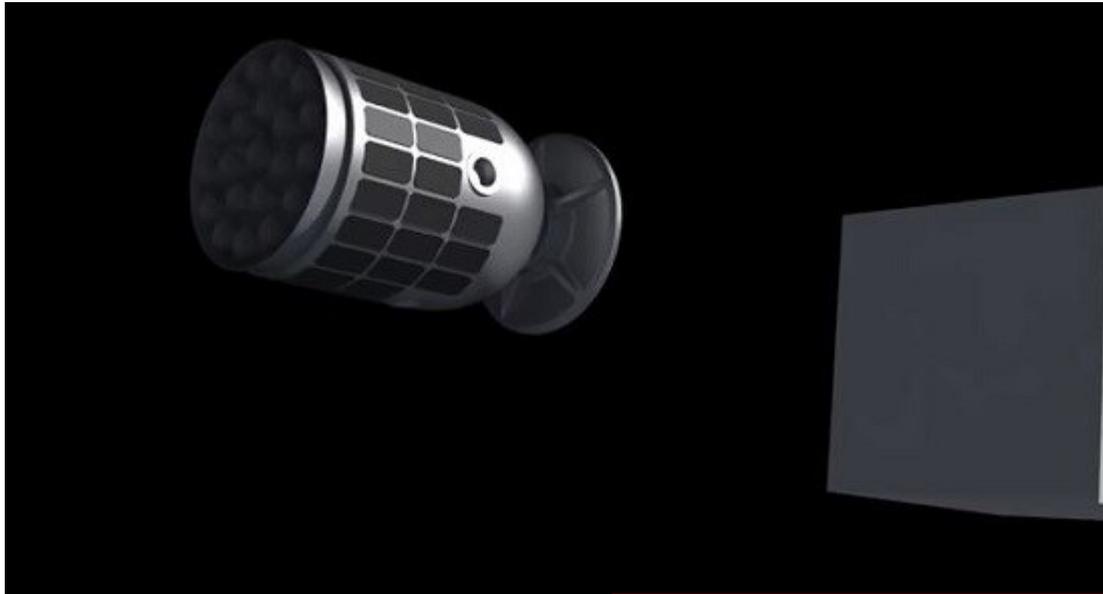


AUTONOMOUS DEORBITING KITS



REMEDICATION

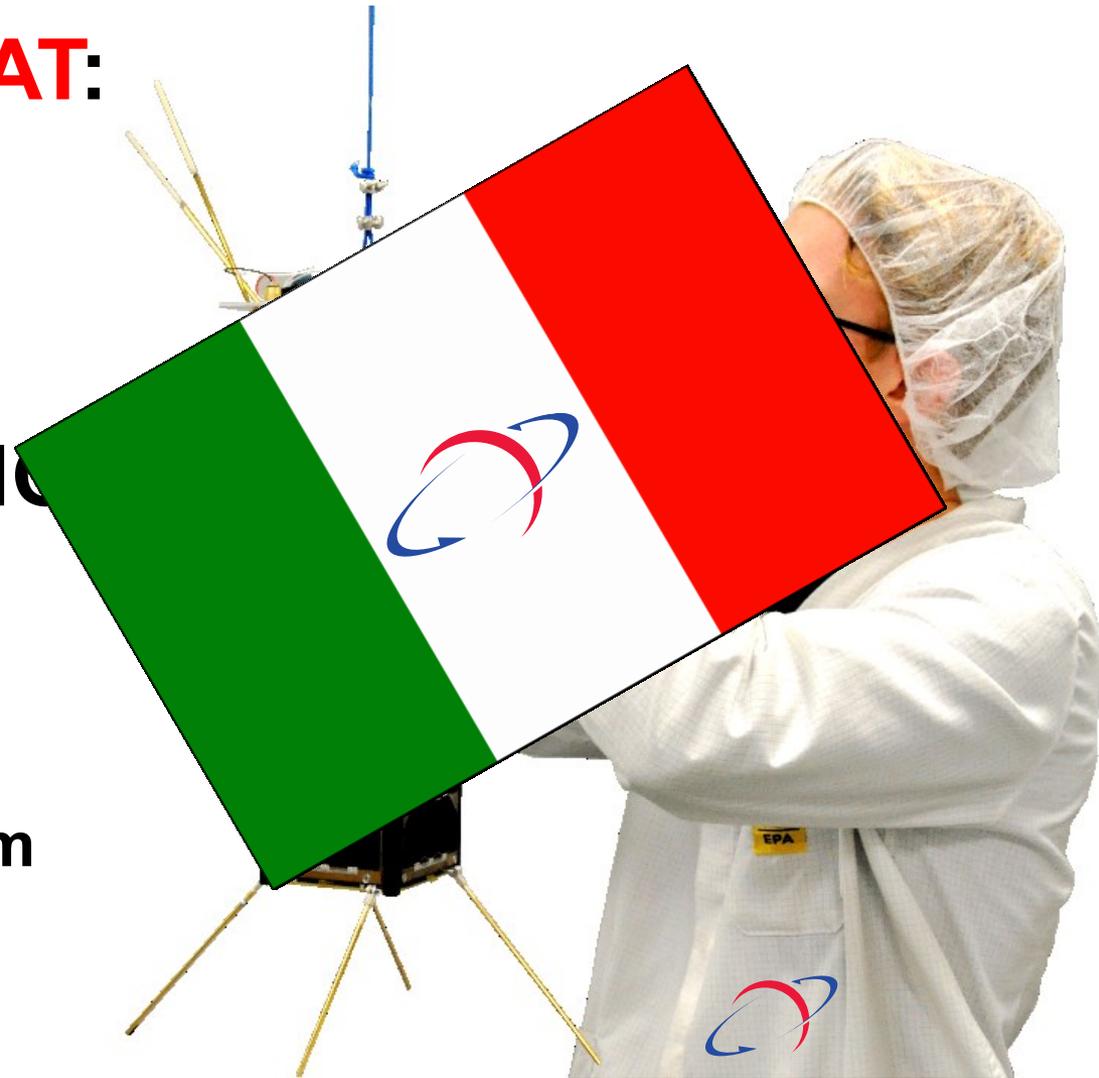
“Brains are better than brawn”



October 2017, D-SAT:

**FIRST SATELLITE
TO PERFORM A
DECOMMISSIONING
MANOEUVRE**

**by an independent
Decommissioning system**

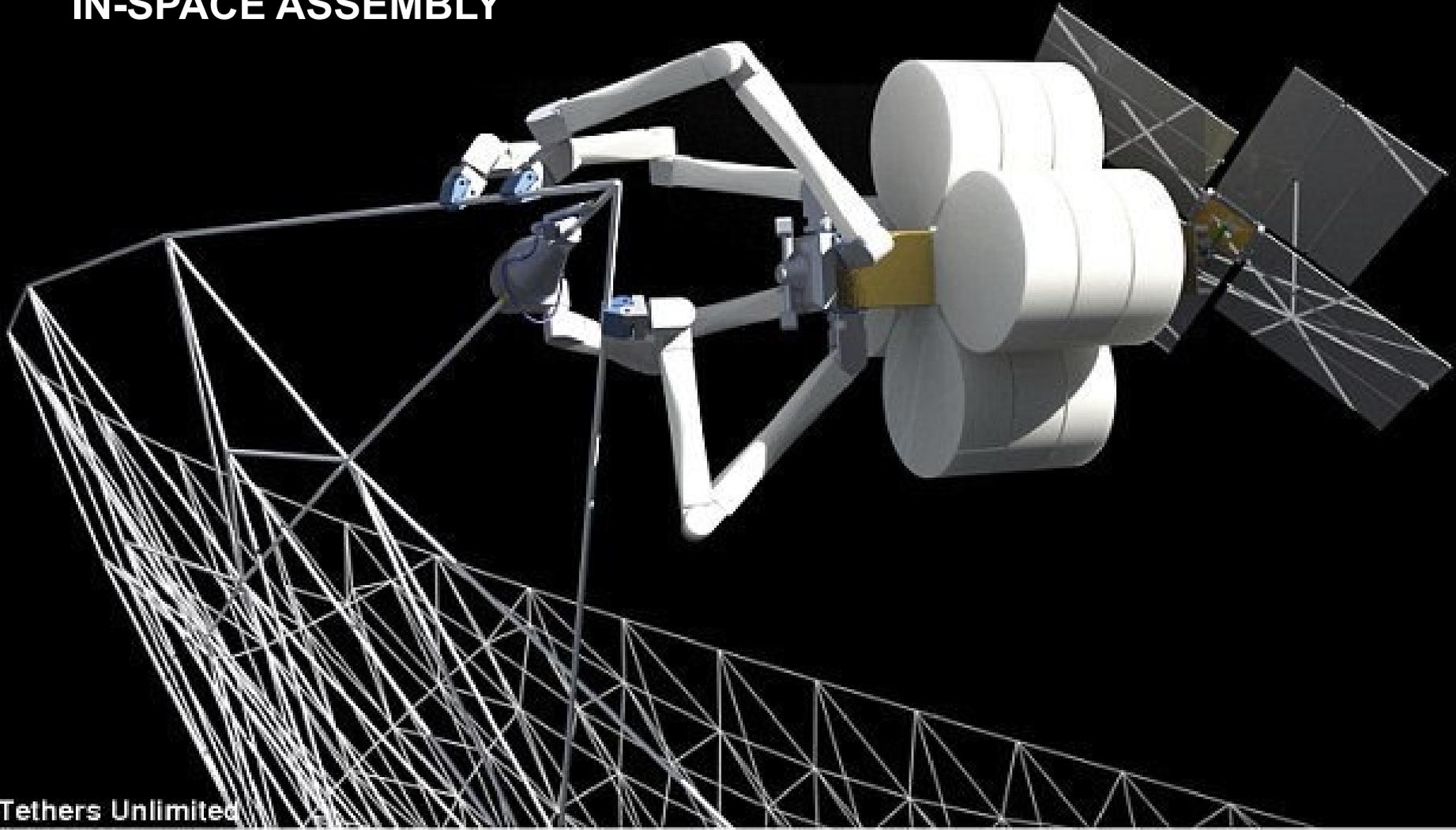




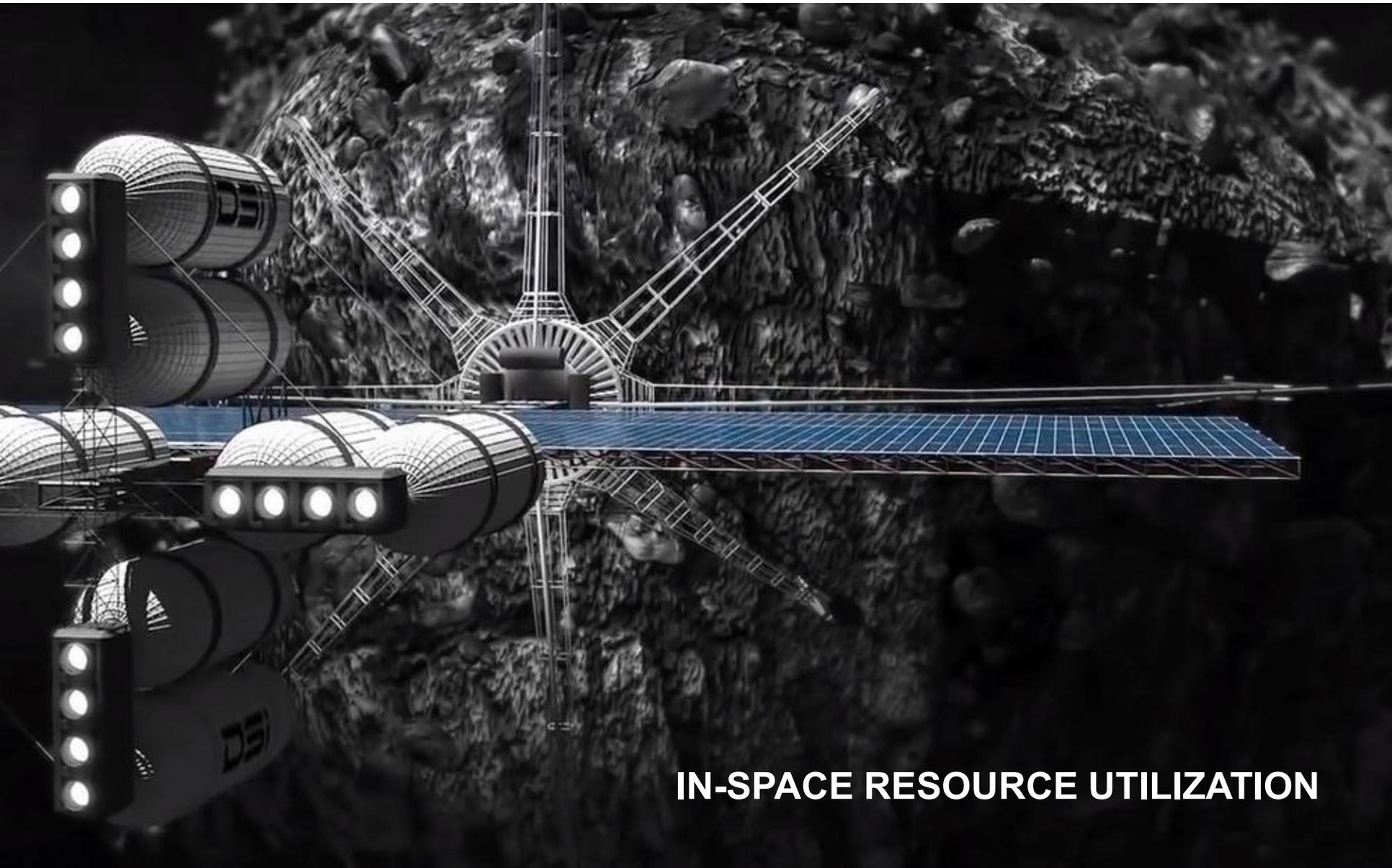




IN-SPACE ASSEMBLY

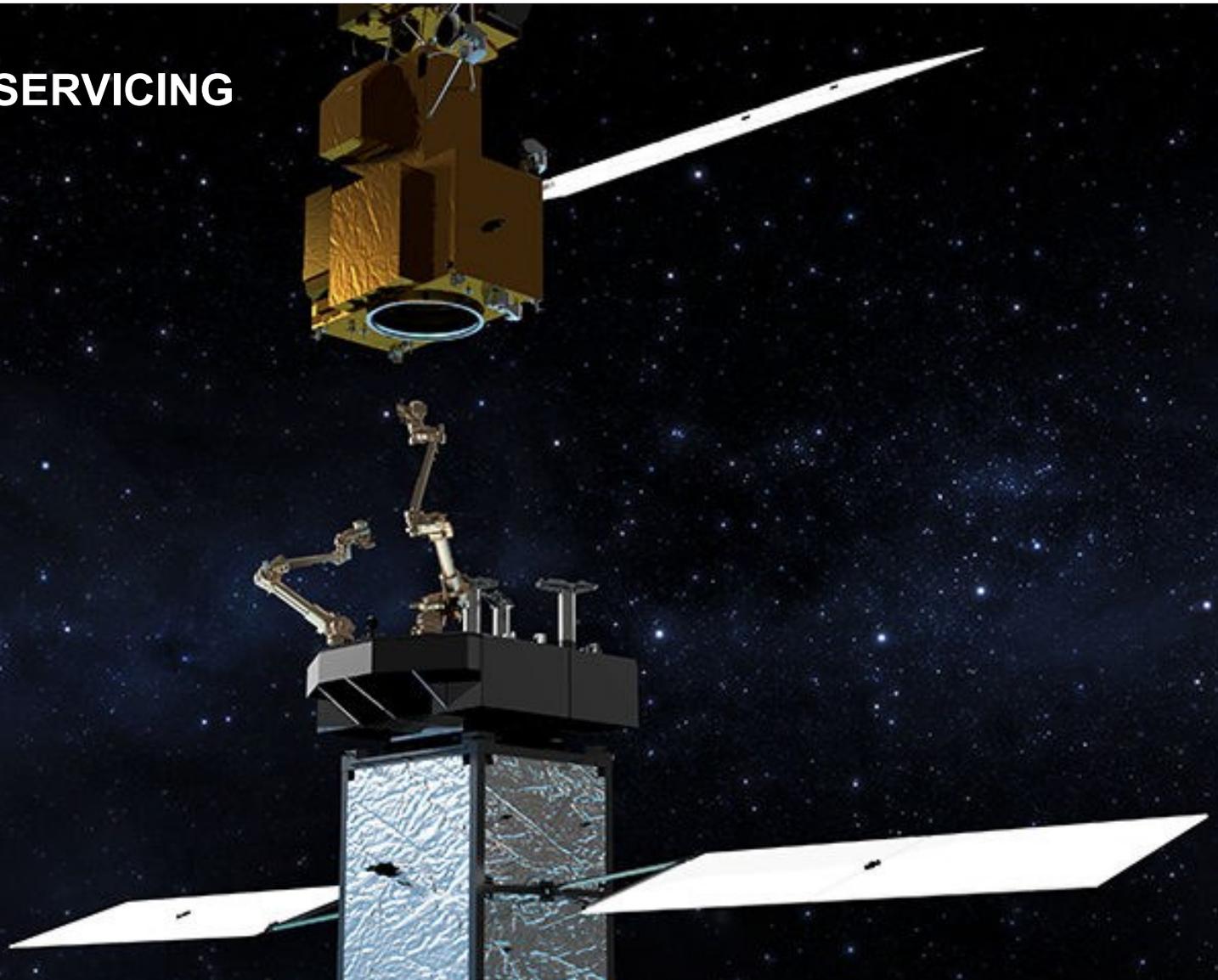


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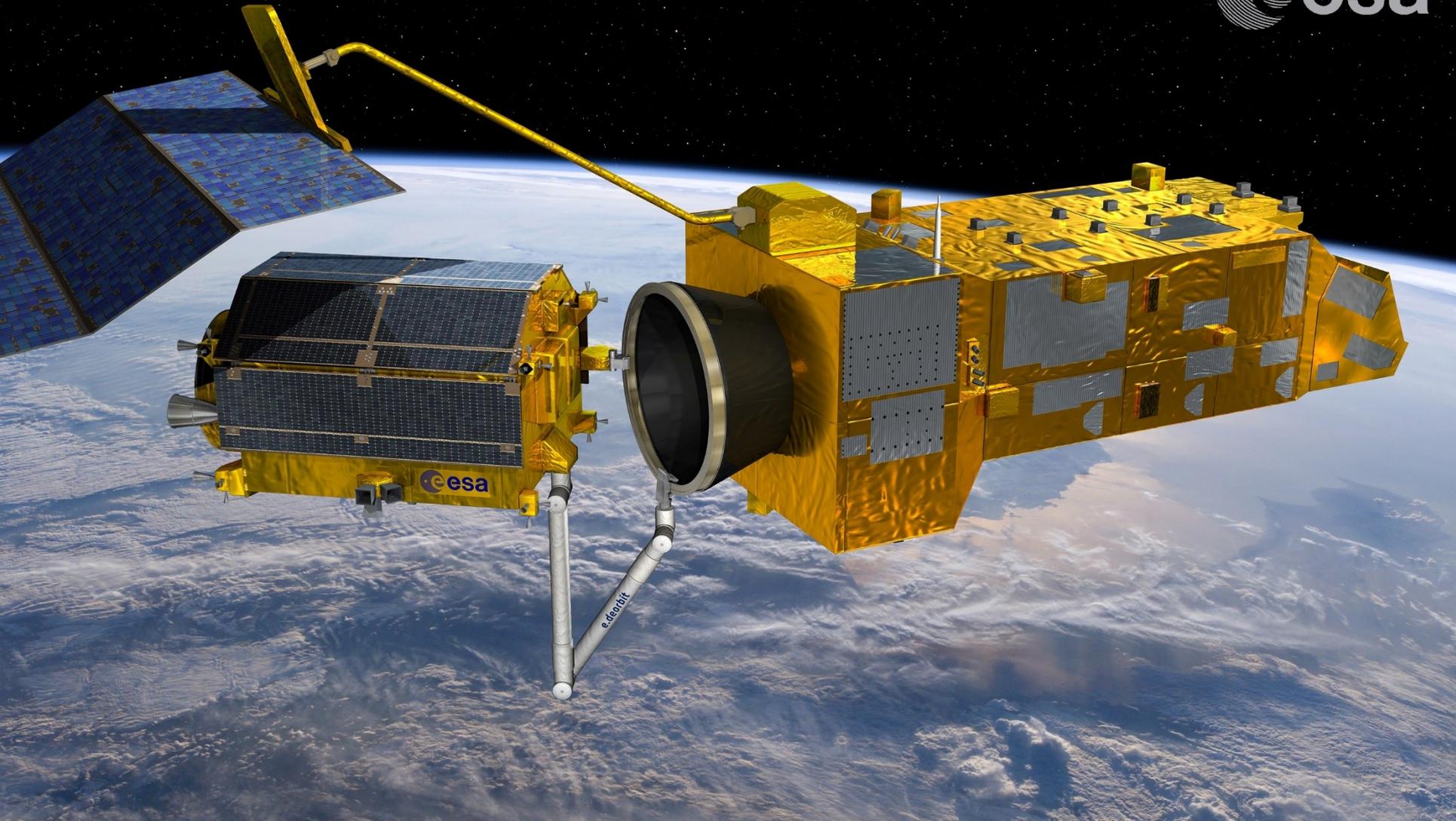


IN-SPACE RESOURCE UTILIZATION

IN-ORBIT SERVICING



IN-ORBIT SERVICING





WHAT'S MISSING HERE?



IN-SPACE TRANSPORTATION

**BE MORE
AWESOME**



LEAVING SATELLITE IN SPACE: 25 YEARS RULE

Example Scenario: 650 satellites

Operational altitude



LARGE CONSTELLATION



Decommissioning Manoeuvre (300 sat per year)

600 km



5 years = +1500 sat
10 years = +3000 sat



25-year re-entry

