

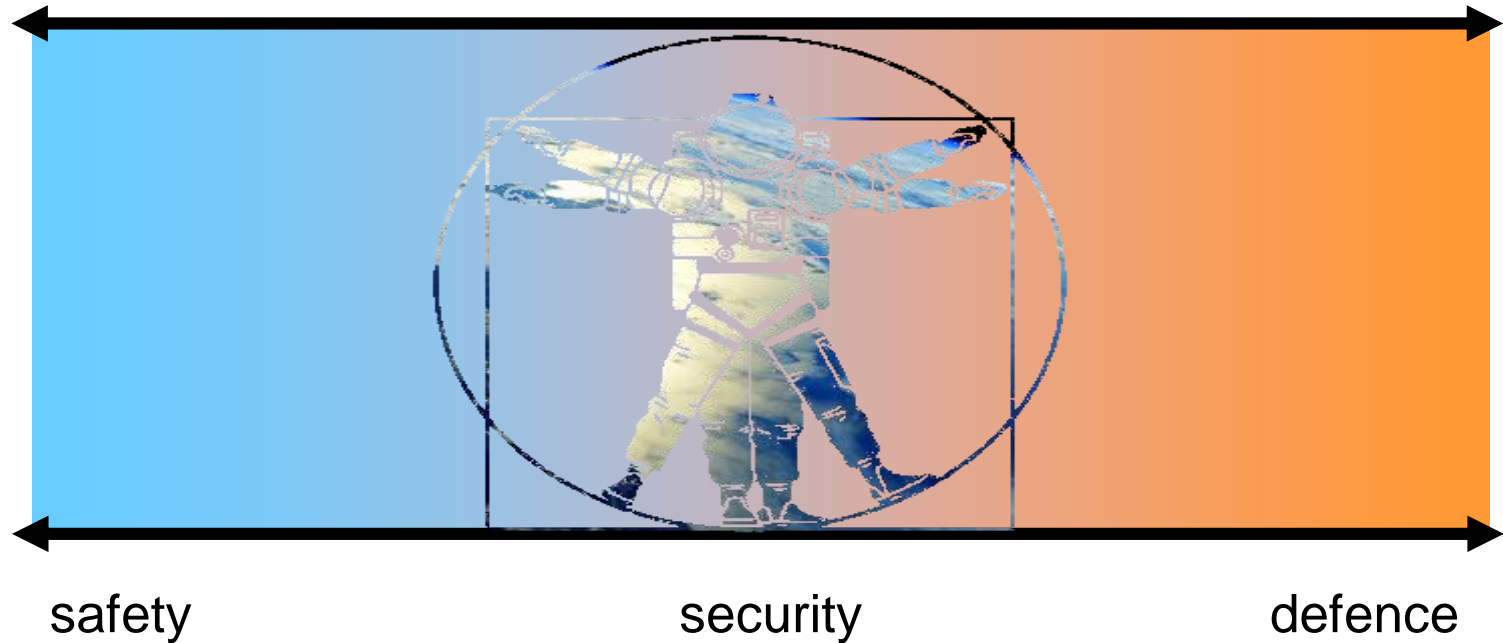
# ESPI Autumn Conference 2018

## Security in Outer Space: Rising Stakes for Civilian Space Programmes

### Keynote speech

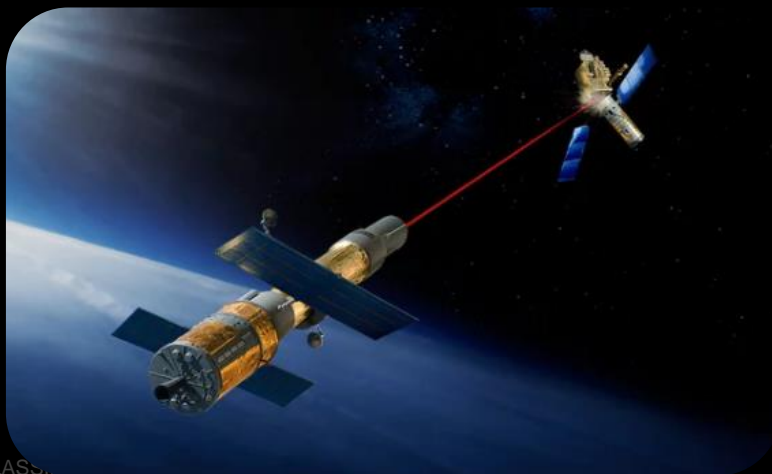
Prof. Dr. Kai Uwe Schrogl, ESA Chief Strategy Officer  
27 September 2018

# Seamless Chain of Citizens Protection



# The U.S. view

"My new national strategy for space recognizes that space is a war-fighting domain, just like the land, air and sea,... We may even have a Space Force, ..."



ESA UNCLASSIFIED

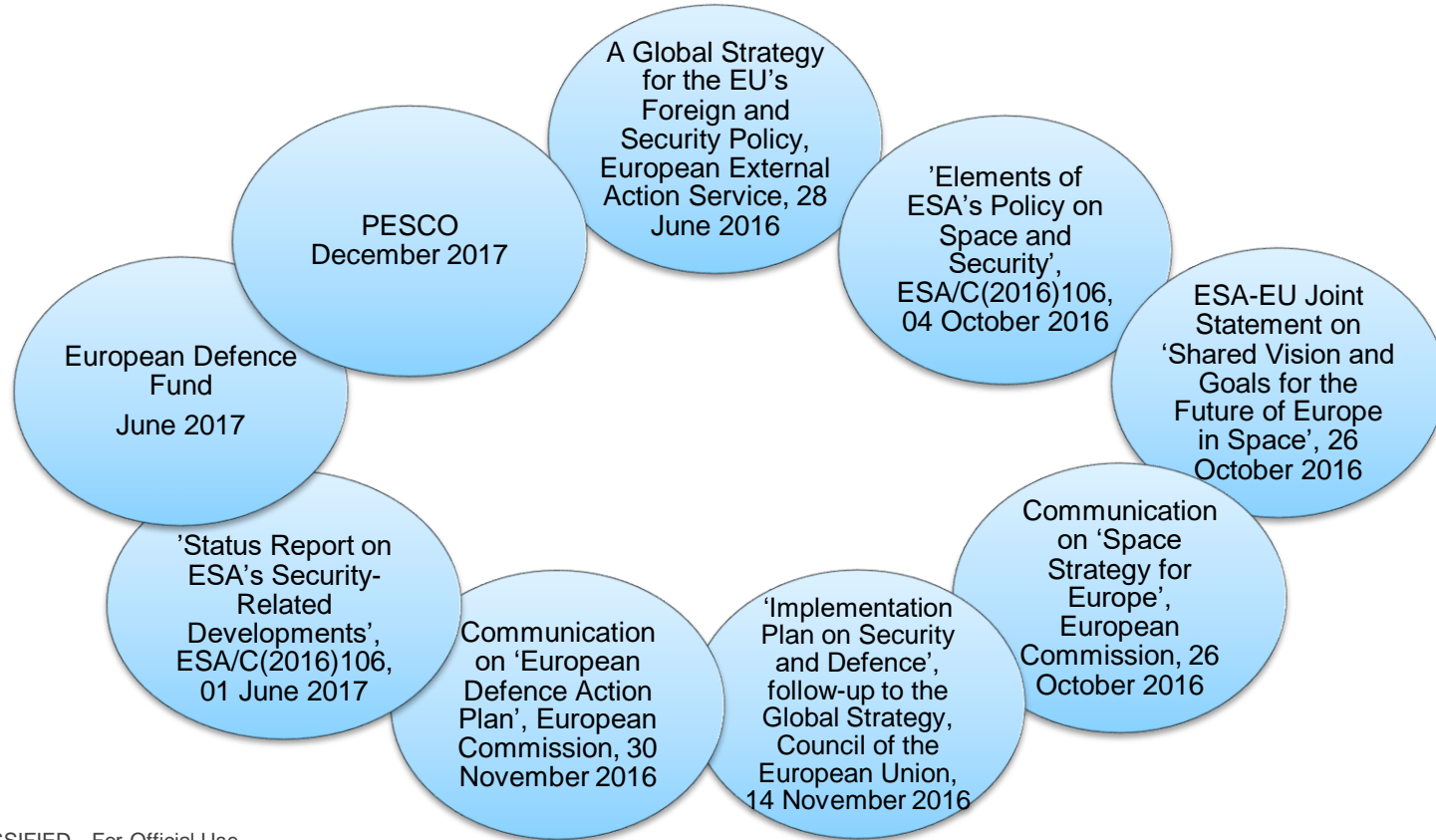


## What Does Trump Mean By 'Space Force'?

The president has proposed the creation of a new military branch that his Defense Department actually opposes.

MARINA KOREN | MAR 13, 2018 | SCIENCE

# Space and Security in a new era





# ESA-EU Joint Statement

European identity, spirit and cohesion



**Full integration of  
space into European  
economy and society**

**A globally competitive  
European space sector**

**European autonomy  
in accessing and  
using space in a safe  
and secure  
environment**

**Excellence in space science and technology**

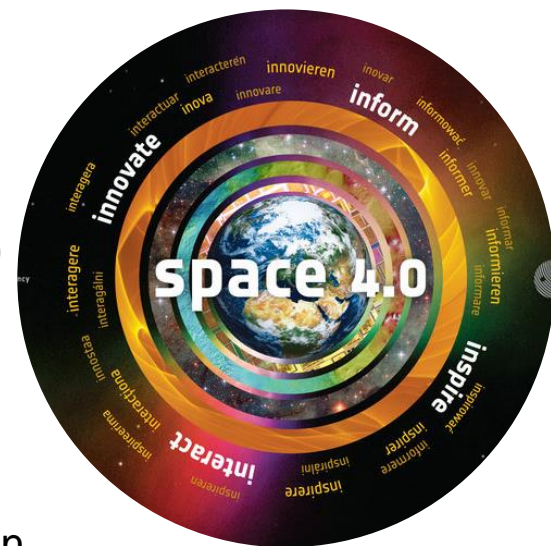
# CM16 Mandate : Strategy for Space Safety and Security

- Space and security in DG's Proposal, Action Item 1.c
- ESA/C/ESA/C(2016)106 *Elements of ESA's Policy on Space and Security*

## OBJECTIVE 5 F

WELCOMES the Director General's proposal (ESA/C-M(2016)1) and in particular:

(f) RECOGNISES that space technology and derived services contribute to providing solutions to security challenges and INVITES the Director General to **establish a strategy concerning ESA space security activities**, in coordination with its Member States and other national and European actors;



# CM19: 4 Main Programmatic Categories

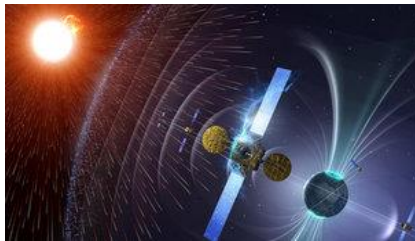
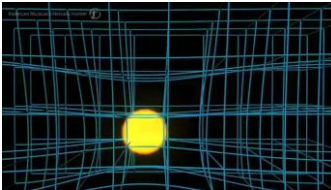
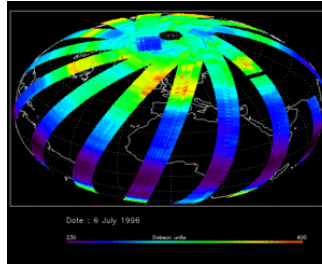


Science and  
Exploration

**Safety and Security**

Applications

Enabling and Support  
(transp., tech, & ops)



ESA UN

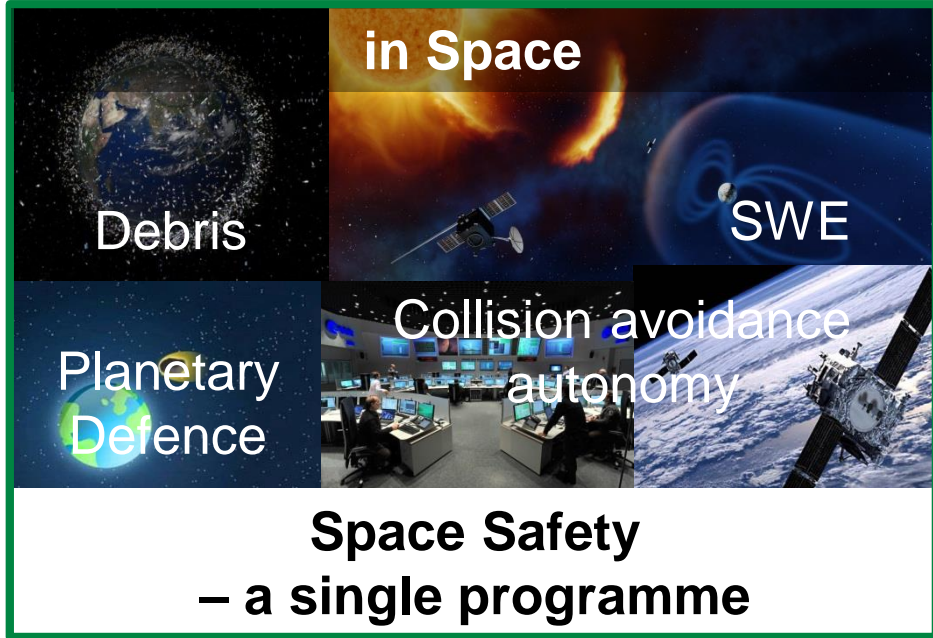
SA | 27/09/2018 | Slide 7



European Space Agency



# Space Safety and Security



A collage of images related to space safety. It includes a field of space debris, a bright orange comet or asteroid, a satellite in orbit, a satellite with the label 'SWE', a control room with operators, and a satellite in orbit with the label 'Collision avoidance autonomy'. The text 'in Space' is at the top right, 'Debris' is on the left, 'Planetary Defence' is on the bottom left, and 'Space Safety – a single programme' is at the bottom.

in Space

Debris

Planetary Defence

SWE

Collision avoidance autonomy

**Space Safety**  
– a single programme



A collage of images related to safety and security applications. It includes a satellite in orbit with the label 'Maritime', a damaged building with the label 'Disaster Management', a field of wheat with the label 'Food', a satellite with the label 'iris', a satellite with the label 'govsatcom', a satellite with the label 'PRECUSOR INITIATIVE', and a satellite with the label 'QKD'. The text 'from Space' is at the top right, 'Safety and Security Applications – several programmes' is at the bottom, and 'Disaster Management' is on the right.

from Space

Maritime

Disaster Management

Food

iris

govsatcom

PRECUSOR INITIATIVE

QKD

**Safety and Security Applications**  
– several programmes



**Cybersecurity of all – Basic Activities**



# Security threats to civilian space programmes

- Access to space
- Cybersecurity in space
- Safe operations in space

# Cybersecurity

Space is a critical infrastructure

- Satellites (jamming, spoofing, blinding)
- Ground stations (hacking)

## MailOnline

### Hackers infiltrate 'two US satellites, achieving all steps required to command the satellite'

By [Daily Mail Reporter](#)

Last updated at 2:56 PM on 30th October 2011

Like 51

Chinese hackers are suspected of grabbing the reins of four US government satellites in 2008 potentially crashing them to Earth or stealing valuable information, more than once.

NASA admits one of the two satellites was temporarily accessed twice in the summer and fall that year, though would not comment on the other.

'While we cannot discuss additional details regarding the attempted interference, our satellite operations and associated systems and information are safe and secure' NASA Public Affairs Officer Trent J. Perrotto said in a statement sent to Talking Points Memo.



# Security in space



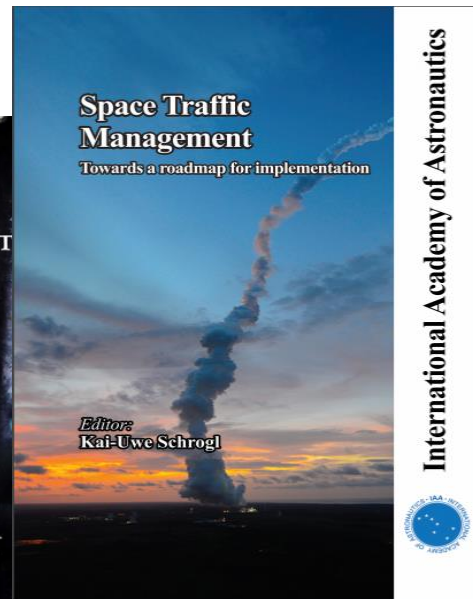
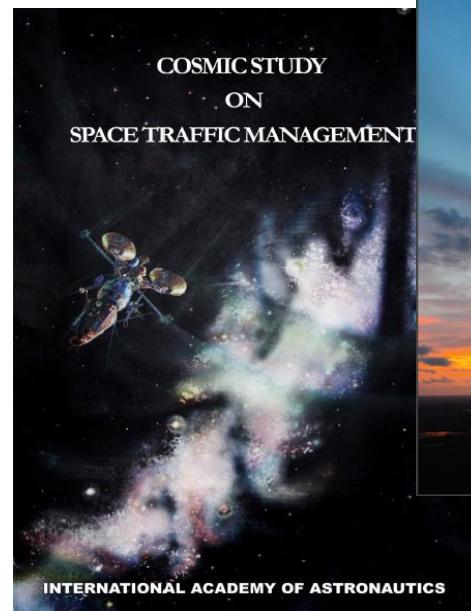
## Space Debris

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# Space Traffic Management (STM)

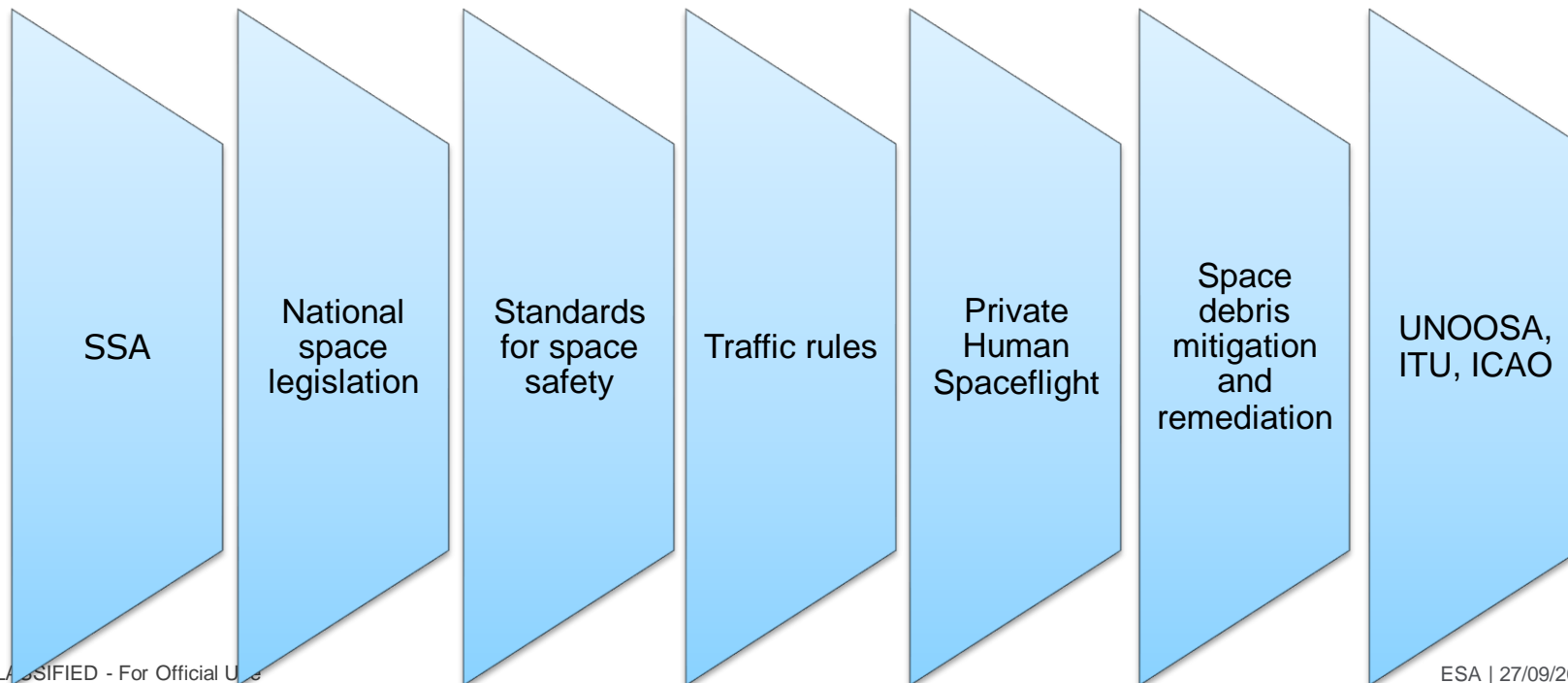


*“Space Traffic Management (STM) is the set of technical and regulatory provisions for promoting safe access into outer space, operations in outer space and return from outer space to Earth free from physical or radio-frequency interference.”*





# An incremental bottom-up approach for STM:



# A comprehensive top-down approach for STM



**Level 1**

## Outer Space Convention (OSC)

Legal principles

Covering current treaties & fixing gaps

(\*developed article-by-article in the Study)

**Plenipotentiary  
Conference**

**Level 2**

## Outer Space Traffic Rules (OSTR)

Rules of technical nature and treaty status by topic

**International  
Conference** (every  
3-4 years)

**Level 3**

## Outer Space Traffic Technical Standards (OSTTS)

Non binding rules to support interoperability, trade  
and sustainability

**OSTTS  
Conference**  
(substantial private  
sector involvement)

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**Body of Law**

**Institutional set-up**



European Space Agency

# Summary and outlook



- Threats to space activities are growing
- Threats (military, non-military, natural) are understood and accepted
- Threats are now more properly and precisely assessed
- Readiness to face and respond to threats is growing in governments and private sector
- Readiness to invest in handling threats is developing
- Readiness to find political solutions in managing threats is emerging

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European Space Agency