**ESA Ministerial\_operations\_FINAL**

Ministers from the 22 ESA member states and Canada will gather in Lucerne, Switzerland on 1-2 December to discuss future spending priorities for the ESA space programme.

ESA members fund a core programme of space activities but can also subscribe to optional programmes.

Before the meeting, each ESA directorate has drawn-up a list of priorities to be considered by ministers. In this report, we hear from ESA’s operations directorate on its proposals for the future, including plans to tackle space debris and the threat to Earth of Near Earth Objects.

**A-ROLL**

[EXOMARS LAUNCH – PROTON EX BAIKONUR 14 MARCH 2016]

Every mission starts…

[ROSETTA END OF MISSION – 30/9/16]

And ends…with mission operations…

[DENSING SET-UP SHOTS AND ESOC GVS]

Over the past fifty years, the European Space Operations Centre – or ESOC – has overseen more than 100 missions…from planning flights, to plotting orbits around the Earth and voyages to distant planets, asteroids and comets.

[ROLPH DENSING, DIRECTOR OF OPERATIONS]

*Our work begins way before the launch of the mission. We determine the flightpath, the orbit for Earth Observation missions, for example, or the long way to a comet or another planet and we fly collision avoidance manoeuvres if need be. So you only have control of a mission if you have the mission control room.*

[GROUND STATION IMAGES]

ESOC is at the heart of a network of ground stations around the world and centres of expertise across Europe.

[ROLPH DENSING, DIRECTOR OF OPERATIONS]

*I consider mission operations as basic for a space agency as launching a mission for example. And therefore it’s very important that our mission operations infrastructure gets adequately funded.*

[SPACE DEBRIS ESA ANIMATIONS – NOT TO SCALE]

But space is a hazardous place – the Earth is surrounded by a cloud of debris from sixty years of human space activities, which could damage satellites…

[SPACE WEATHER ESA ANIMATIONS]

The Earth is also being bombarded by space weather – solar storms and charged particles ejected from the Sun.

[AURORA VT FROM ISS]

This could knock out satellites and even communications systems and power grids on the ground.

[LUTETIA AND STEINS ASTEROID IMAGES FROM ROSETTA MISSION]

Near Earth Objects also threaten the Earth and could potentially collide with our planet. All these threats are monitored under ESA’s Space Situational Awareness programme, which the Operations Directorate hopes to see continue to evolve…

[ROLPH DENSING, DIRECTOR OF OPERATIONS]

*We want to protect our assets on Earth and in orbit against impacts from space. Maybe from space weather or impacts from Near Earth Objects and we also want to protect our spacecraft in orbit from risks coming from space debris.*

[ESOC EXERIORS AND INTERIORS]

As well as providing core funding for mission operations, ministers will be asked to consider supporting Space Traffic Management. This moves beyond monitoring space hazards, such as debris and Near Earth Objects, to tackling them.

[AIM ANIMATIONS]

Missions being proposed include AIM – an asteroid impact mission, to test the technology for deflecting an asteroid…

[E.DEORBIT ANIMATIONS]

…And a deorbit mission to actively remove space debris from orbit.

**End A-Roll : 10:02:47:09**

**B- Roll**

BROLL 002: 10:05:34:21 to 10:06:43:06

Ralph Densing, Director of Operations, ESA

3 clips in English (from A-roll)

BROLL 003: 10:06:43:06 to 10:07:28:19

Launch of ExoMars mission on a Proton rocket from Baikonur 14 March 2016

BROLL 004: 10:07:28:20 to 10:08:31:05

End of Rosetta mission, ESOC 30/9/2016

BROLL 005: 10:08:31:06 to 10:09:58:08

Animations, space debris (not to scale)

BROLL 006: 10:09:58:09 to 10:10:46:12

Animations, space weather and Earth’s magnetic field

BROLL 007: 10:10:46:13 to 10:11:10:08

Aurora from the ISS

BROLL 008: 10:11:10:09 to 10:13:42:03

Animations Asteroid Impact Mission (AIM)

BROLL 009: 10:13:42:03 to 10:14:15:03

Animations e.DeOrbit mission