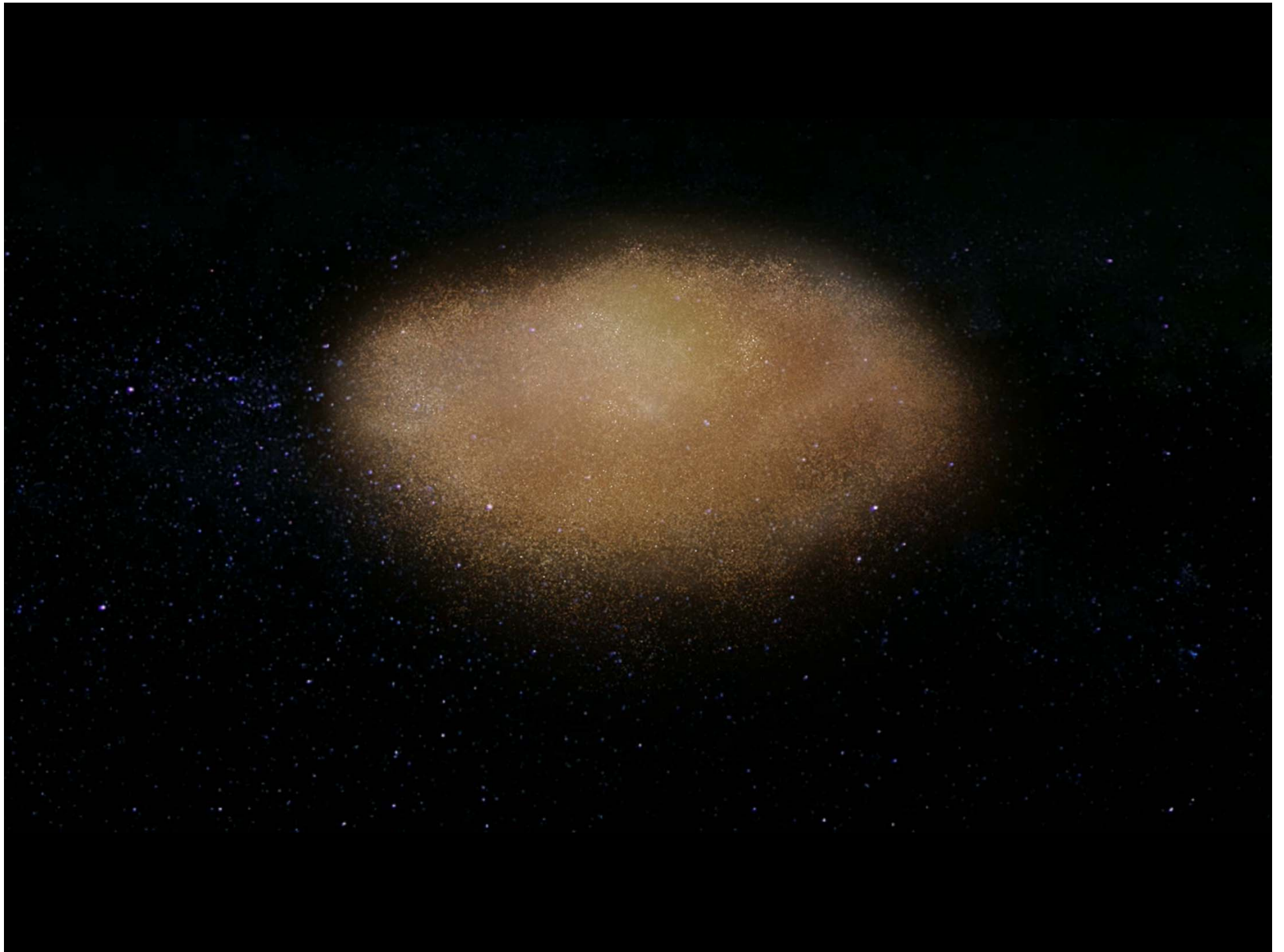


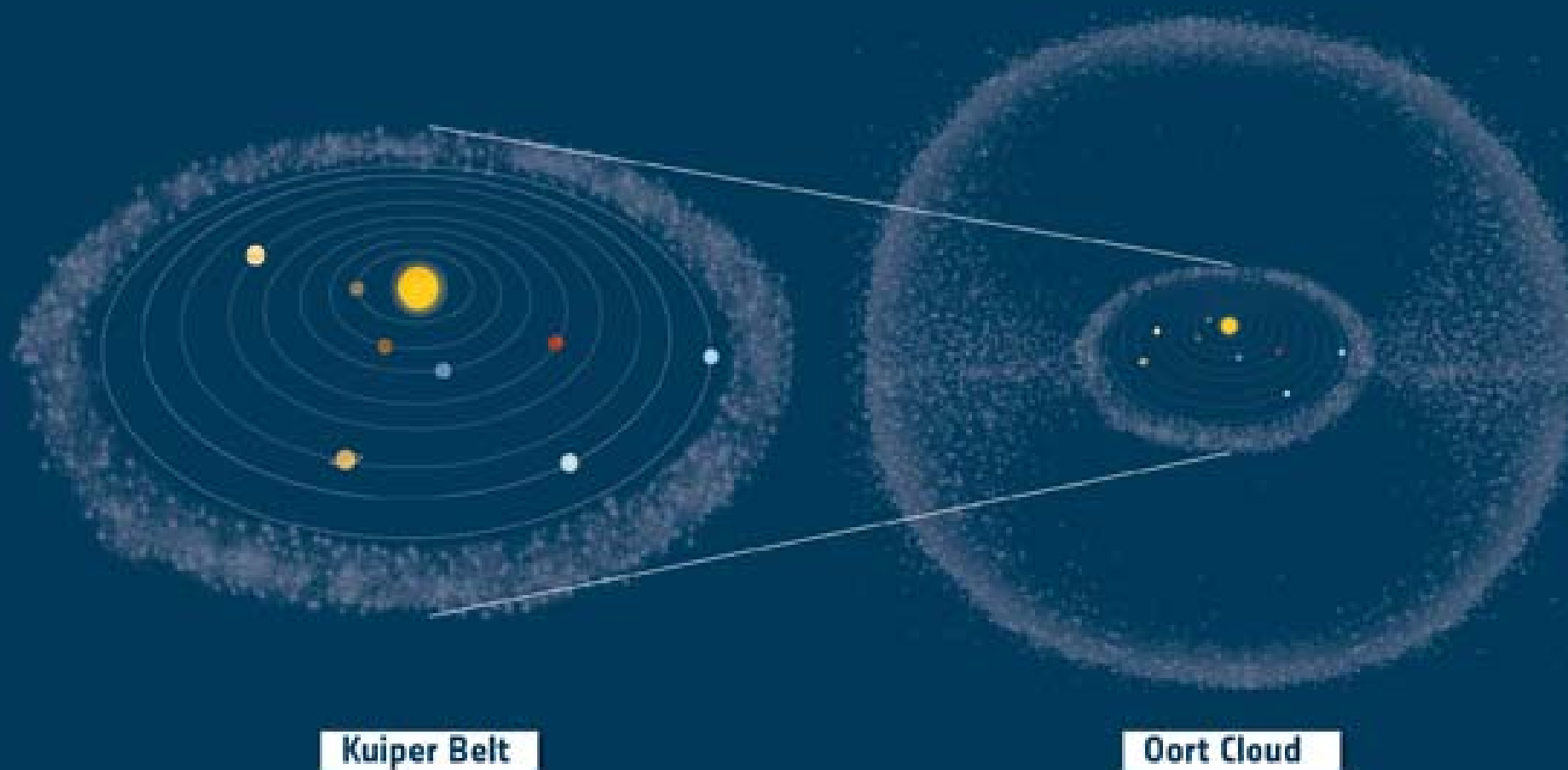
Rosetta: the craziest mission ever...

Alessandro Ercolani – European Space Agency (ESA)

DESY 23.02.2016 Hamburg – 24.02.2016 Zeuthen - Germany

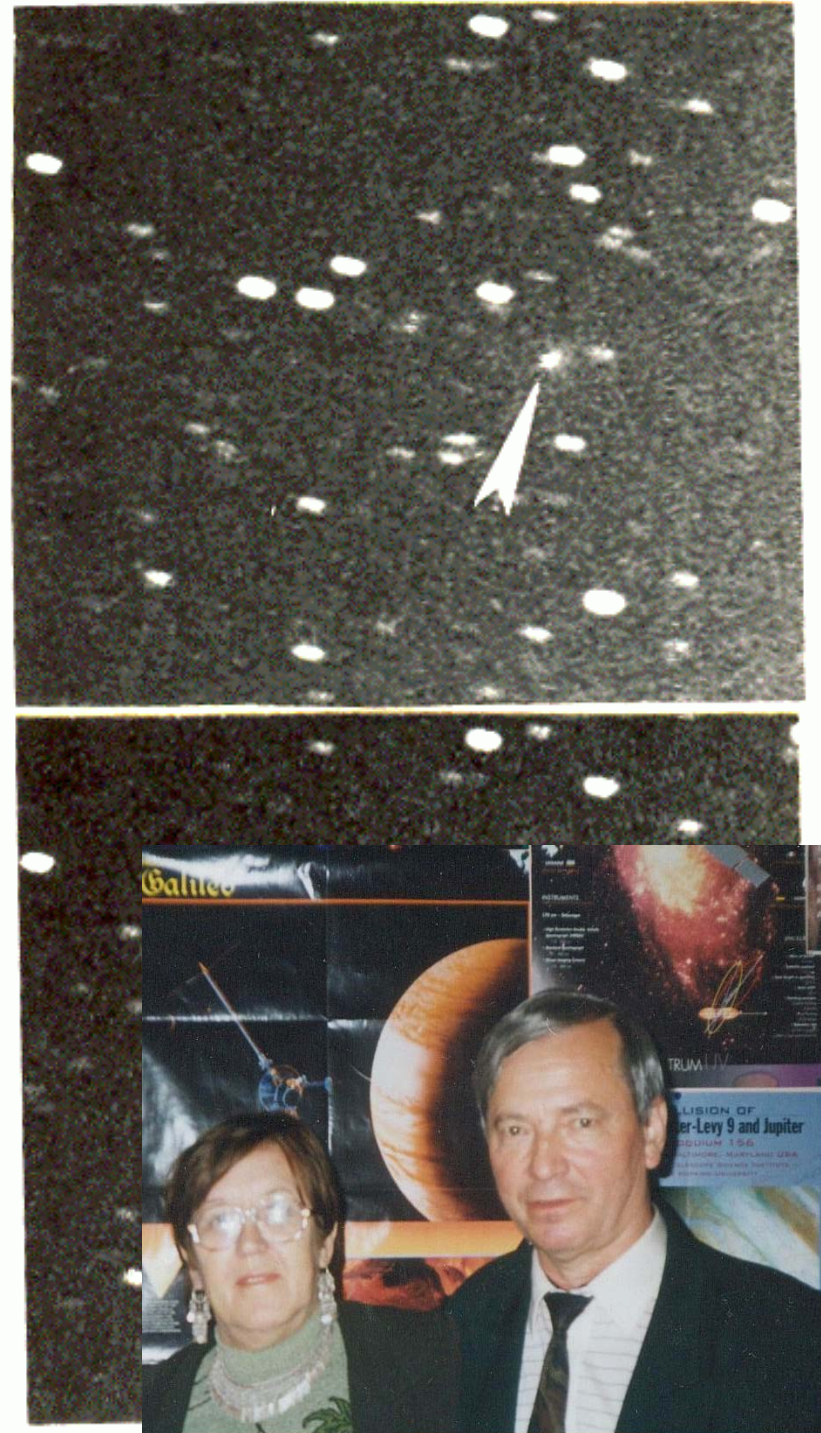
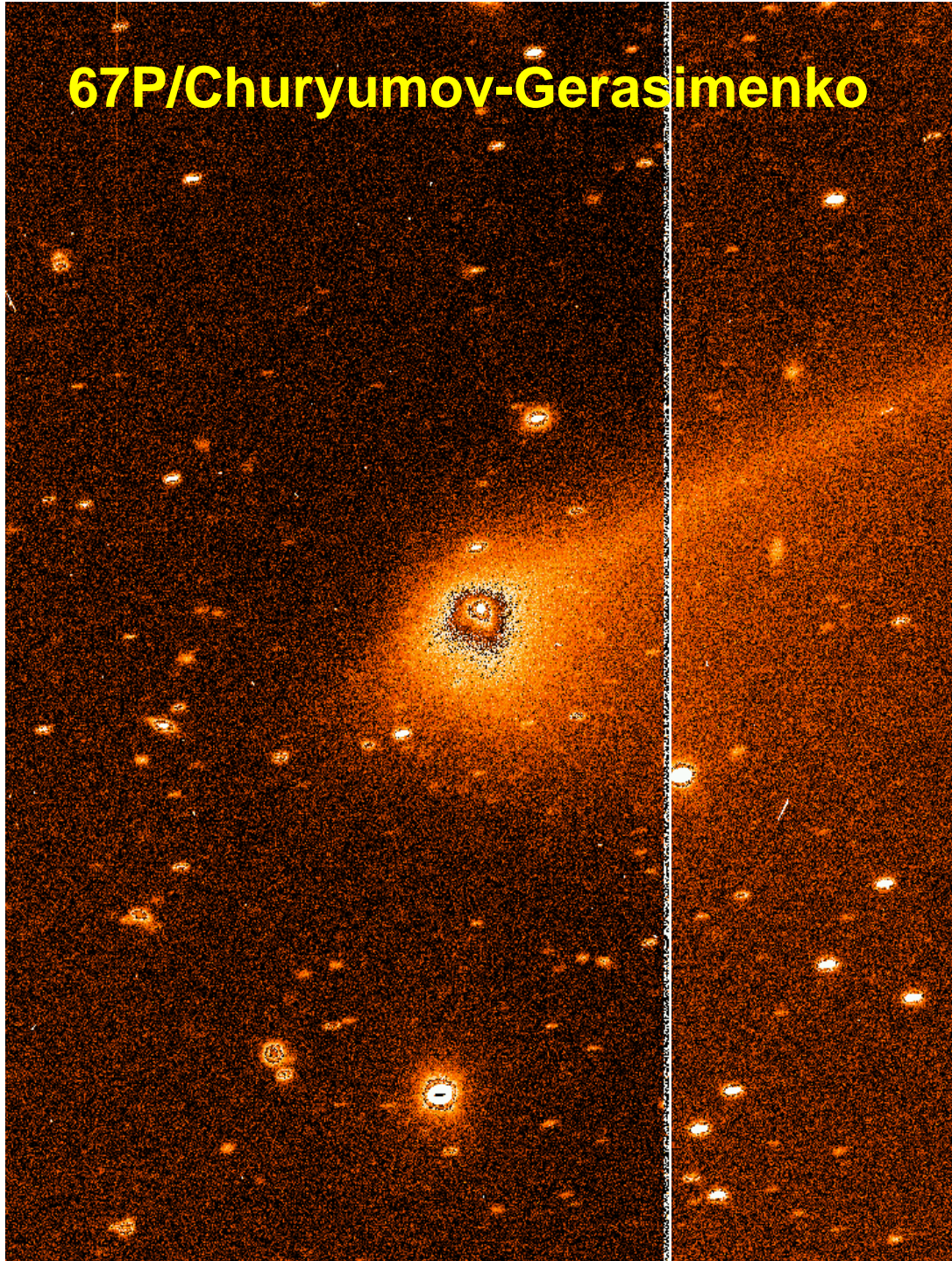


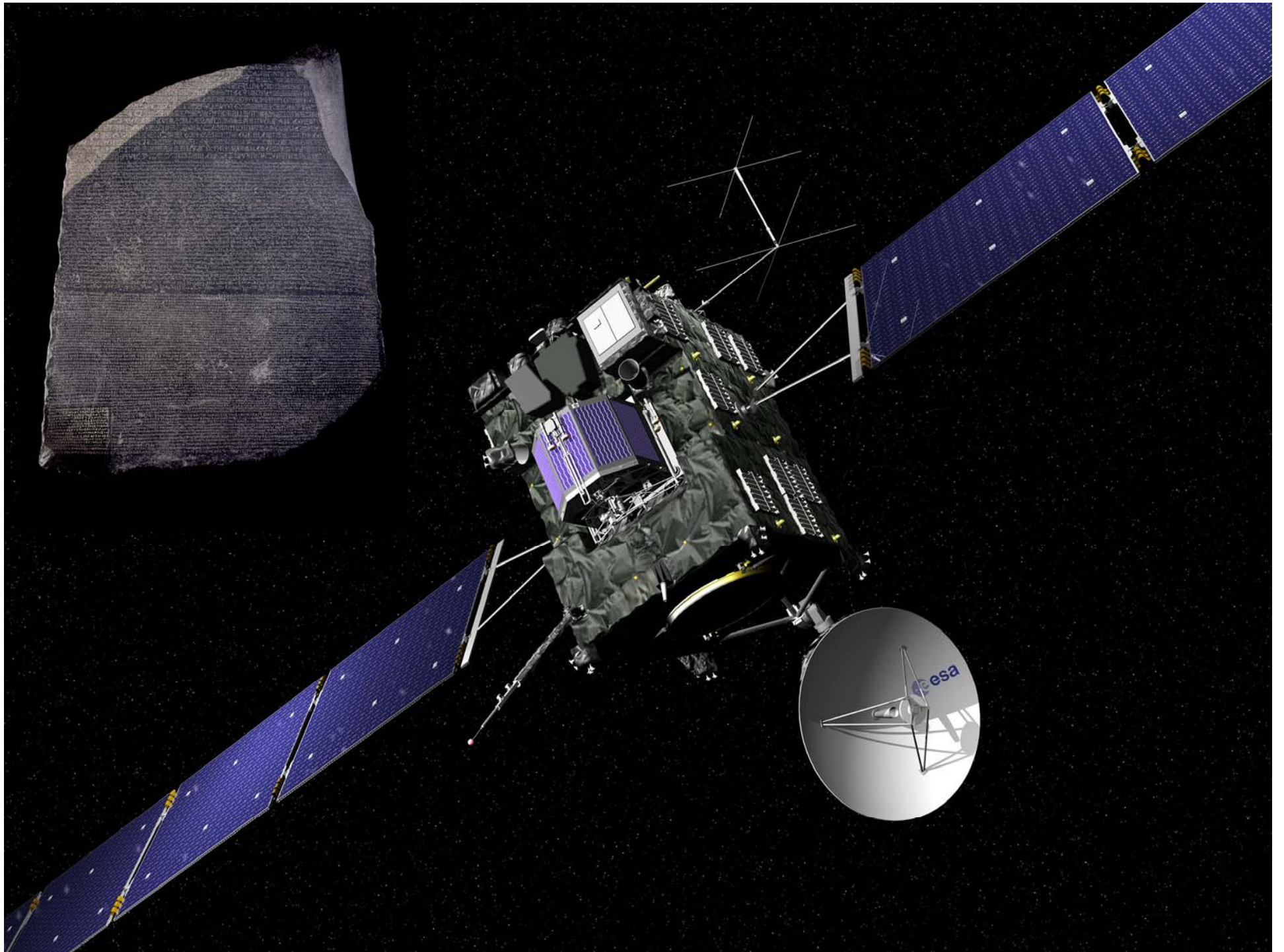
Where do comets come from



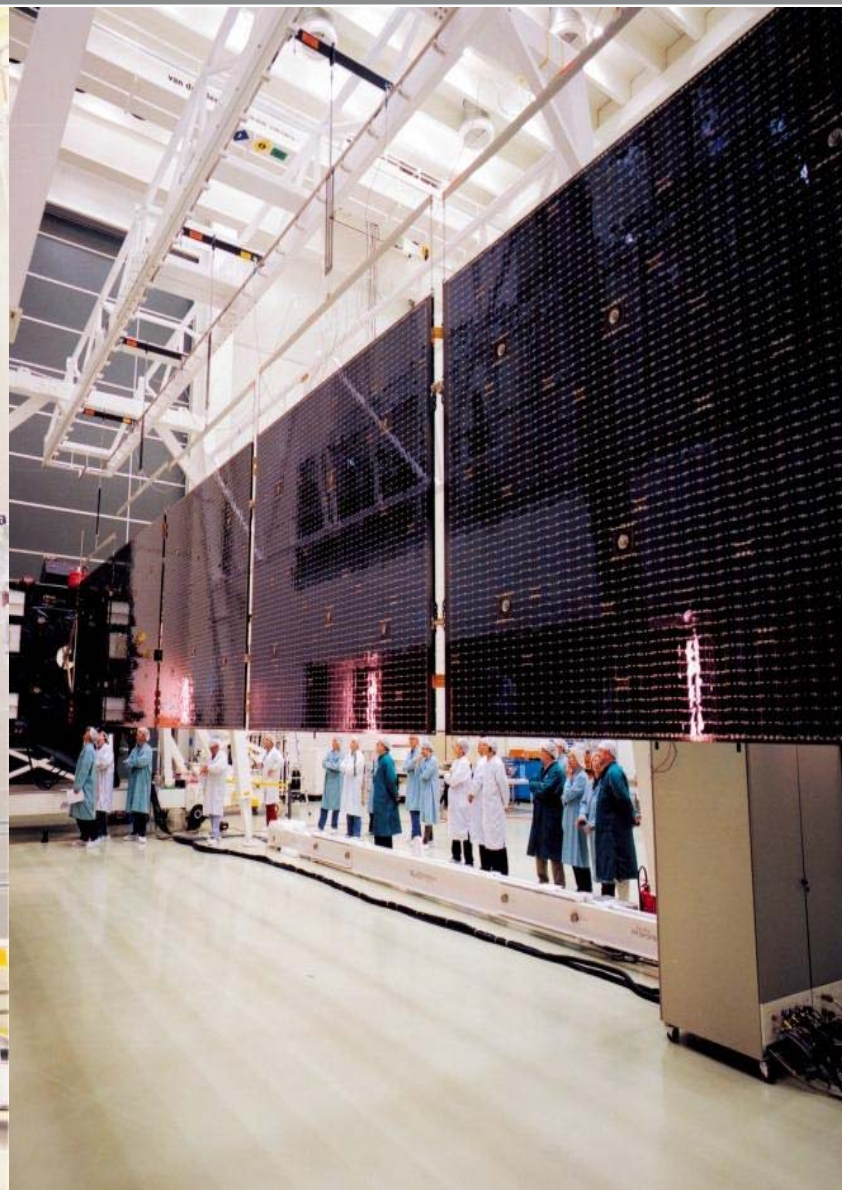


67P/Churyumov-Gerasimenko



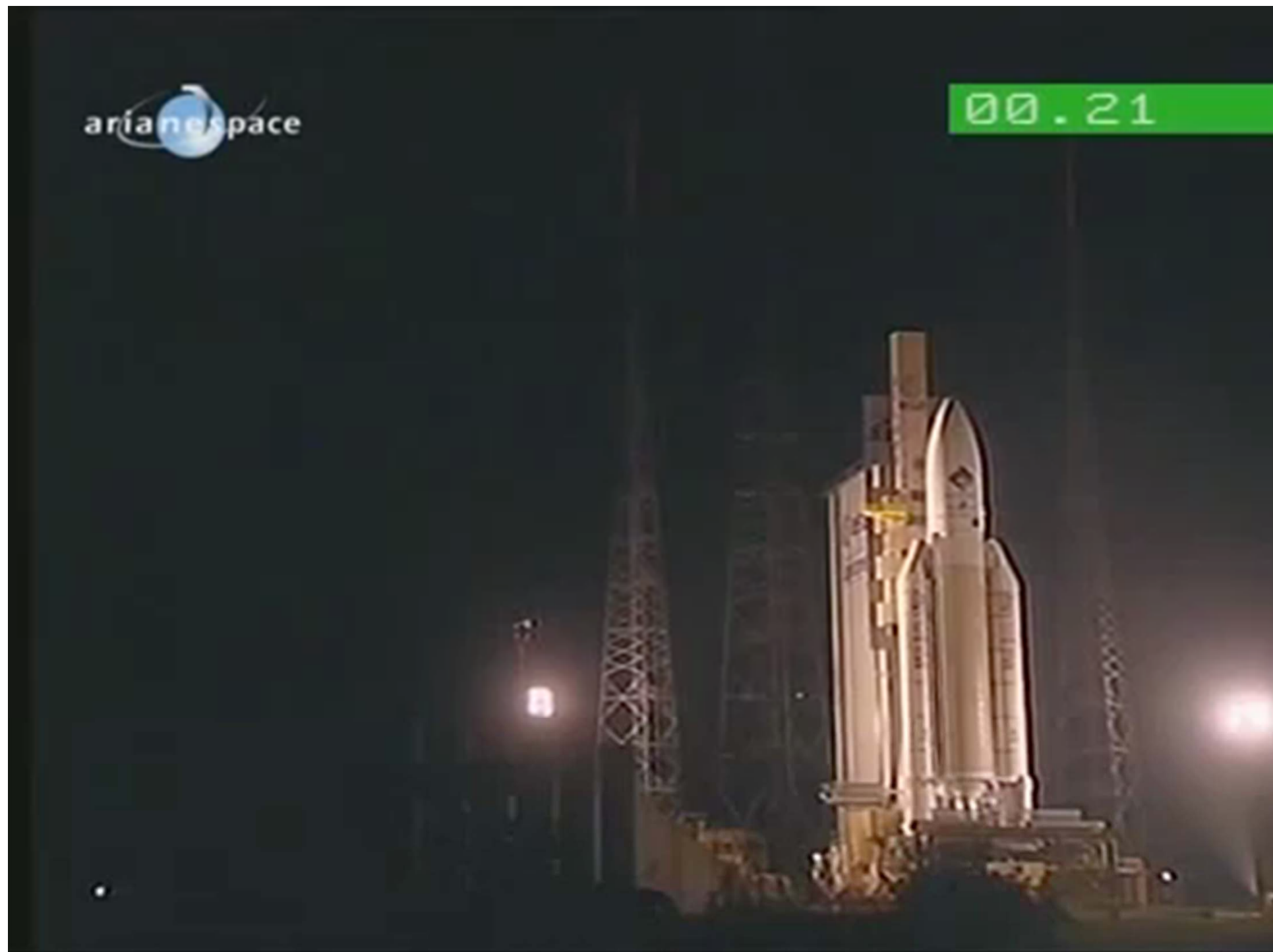


Rosetta: technical data

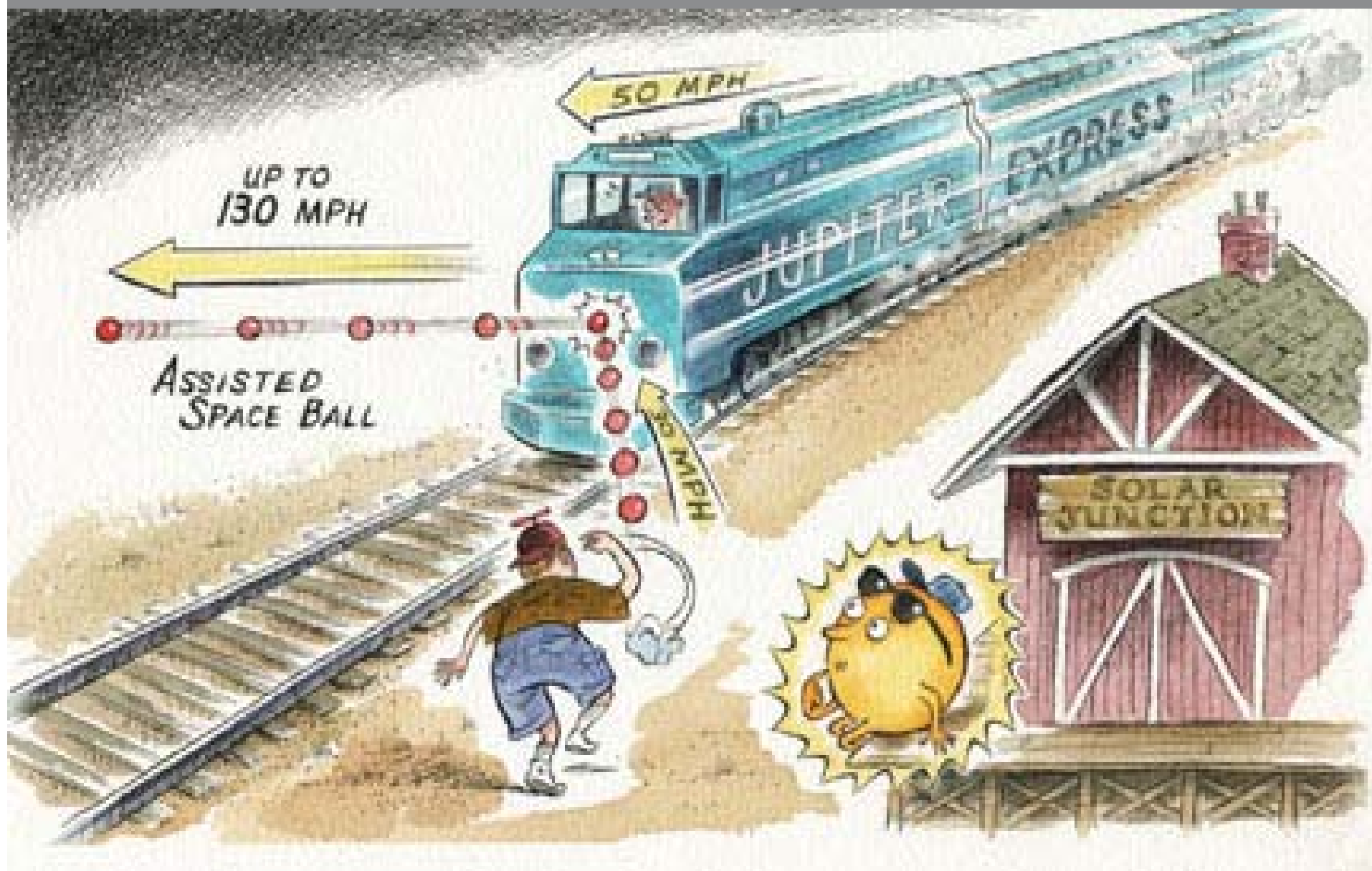


arianespace

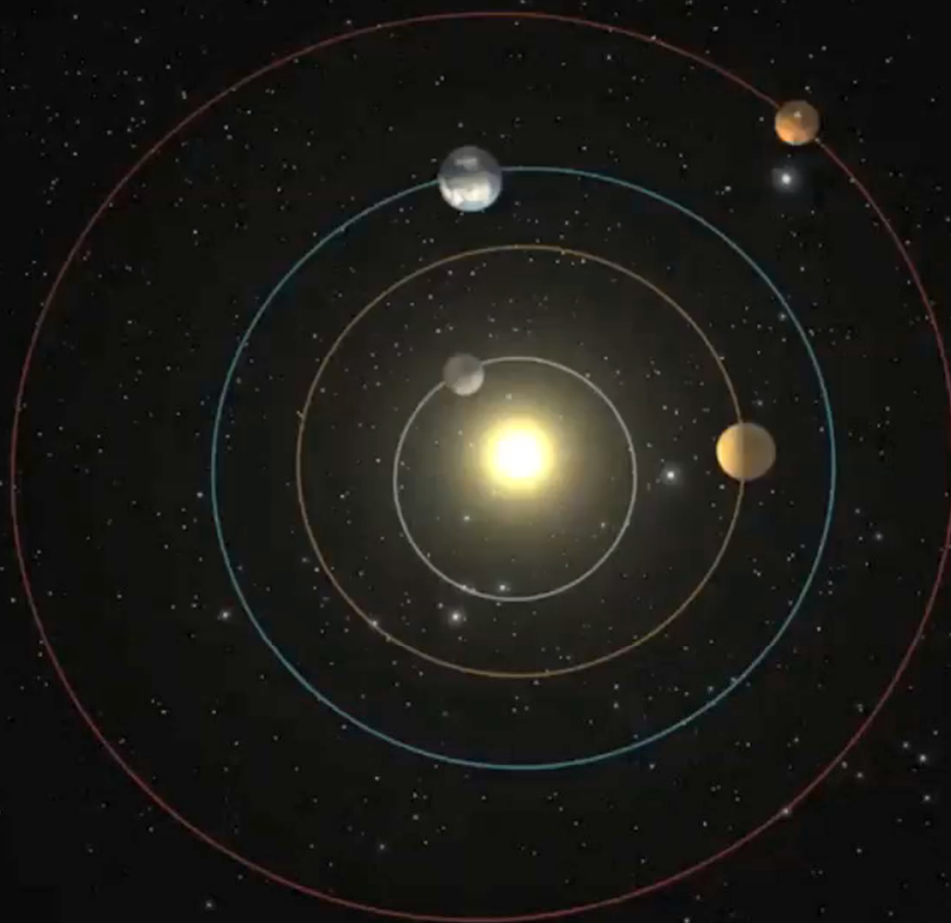
00.21



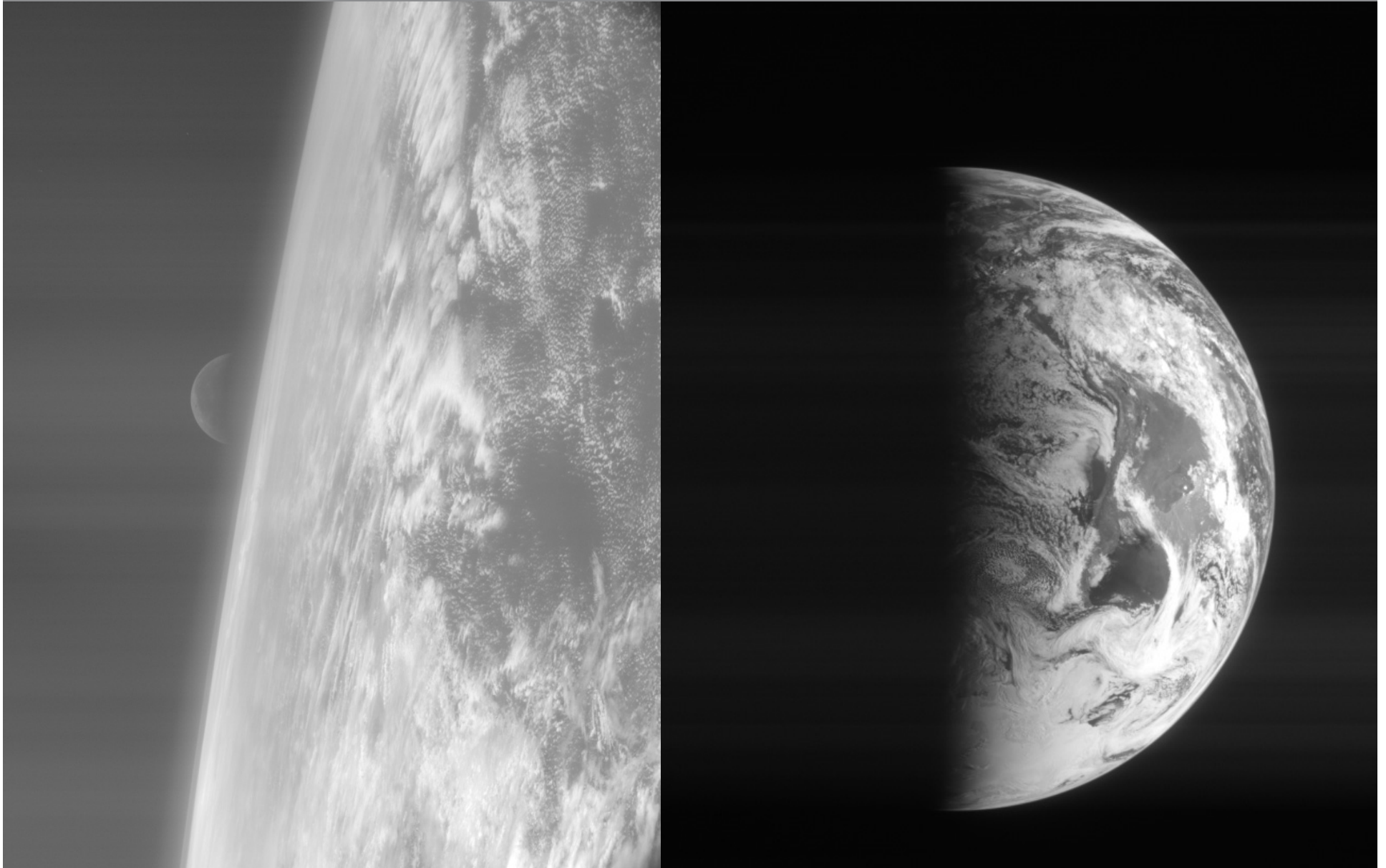
Gravity assist manoeuvres



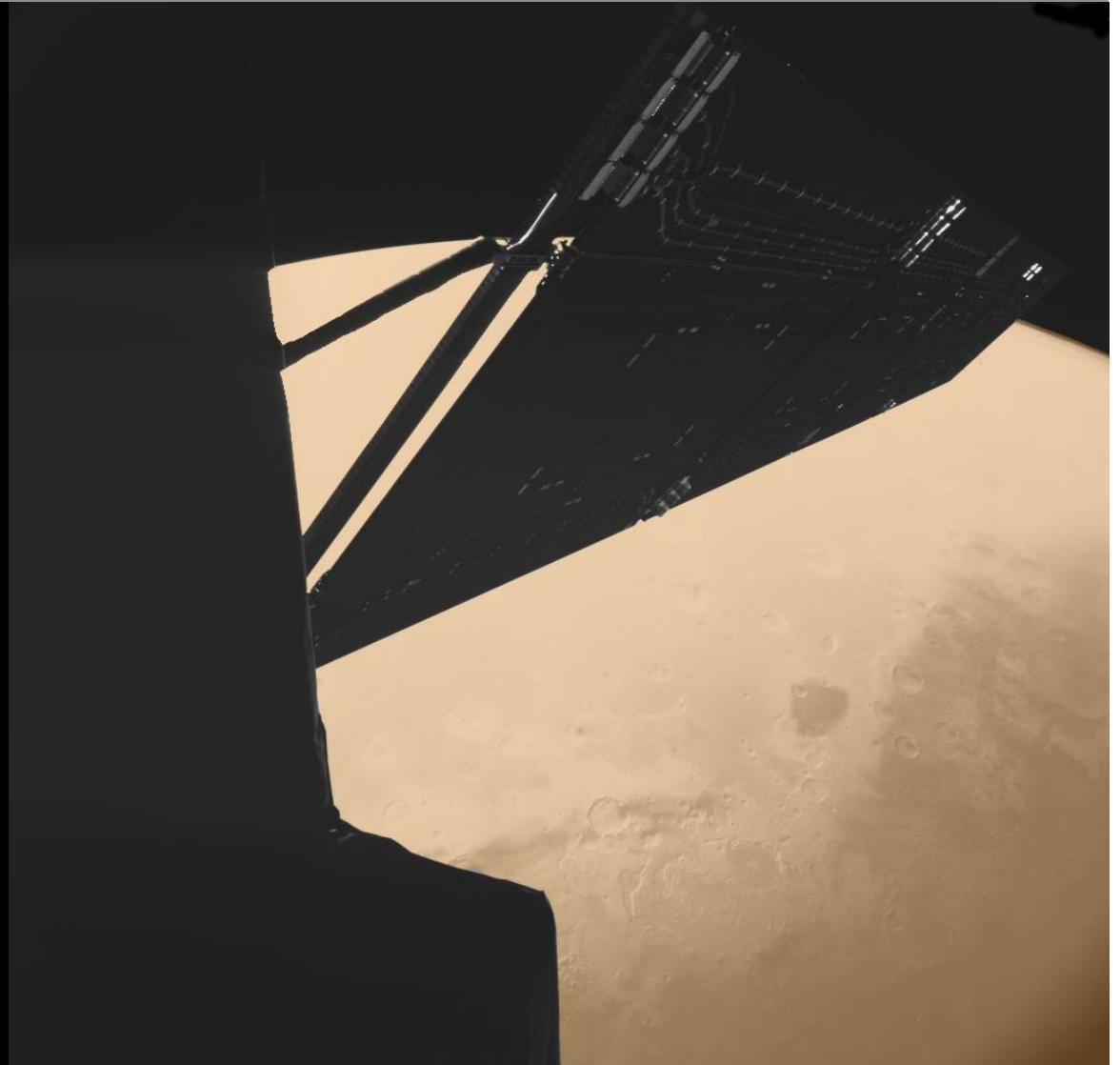
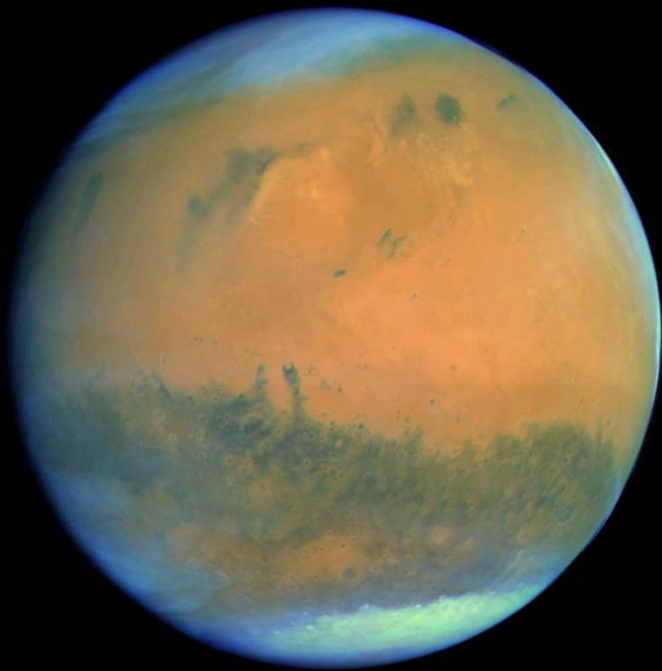
The long journey



First Earth fly-by (4/3/2005)



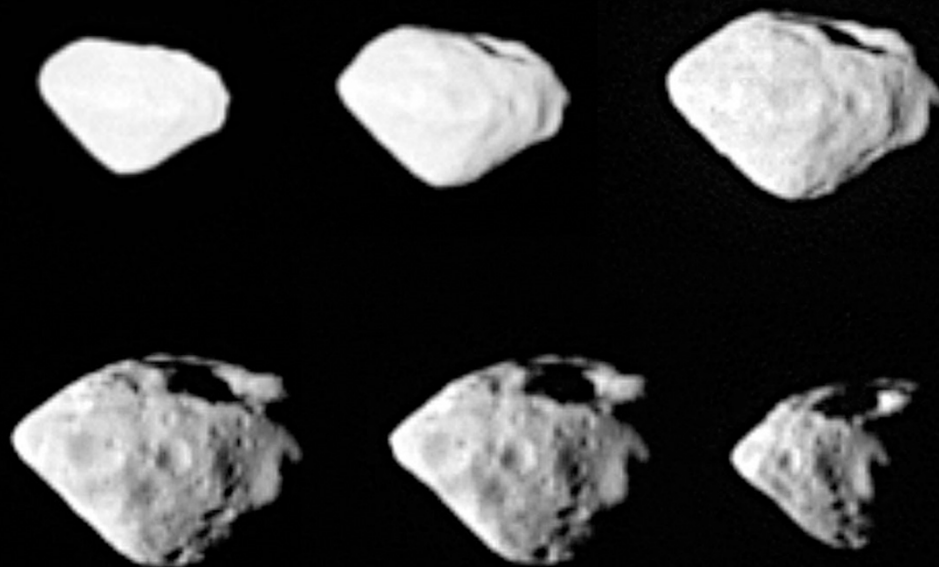
Mars fly-by (a space selfie!) 2007



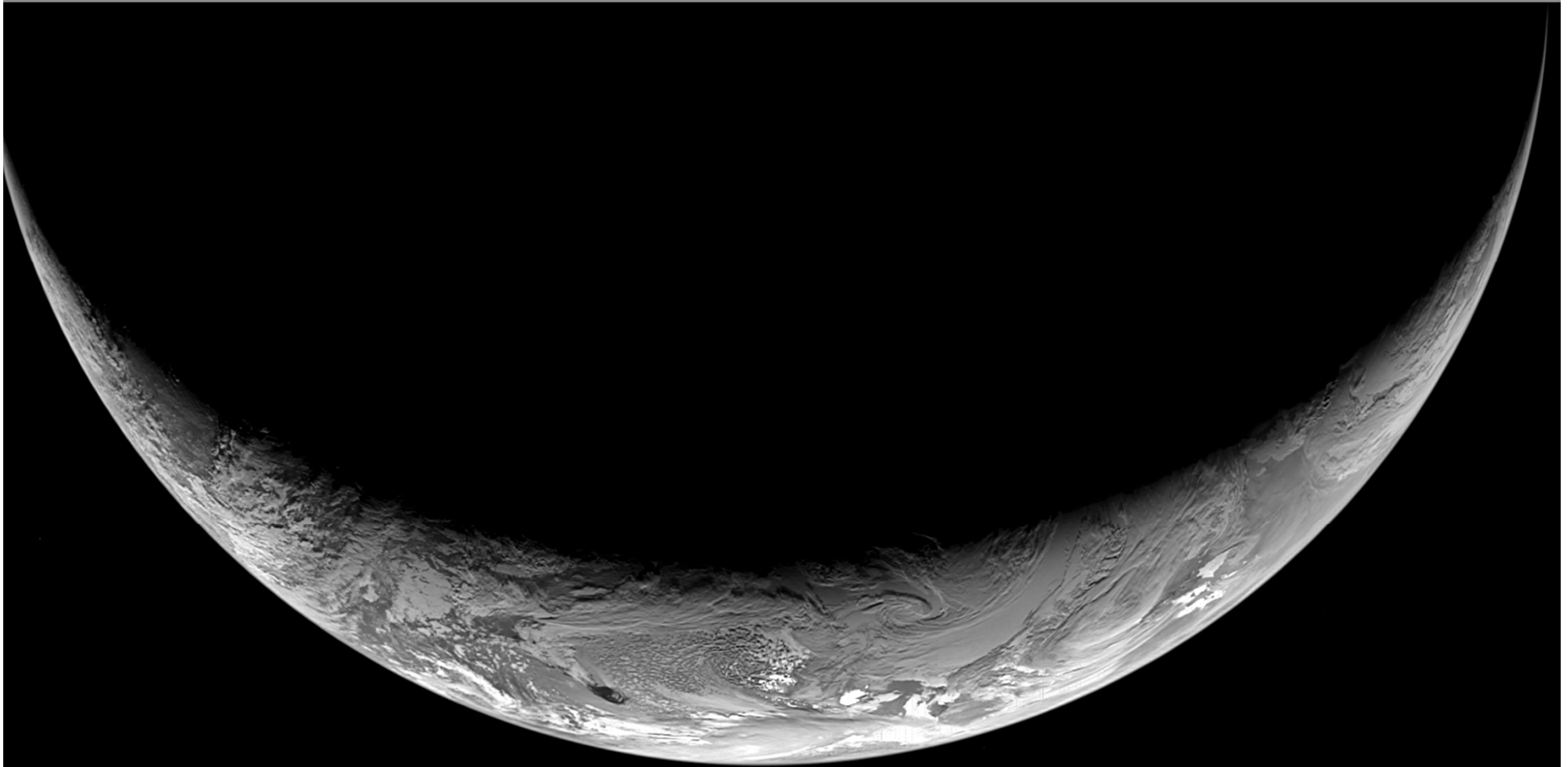
Second Earth fly-by – 13/11/2007



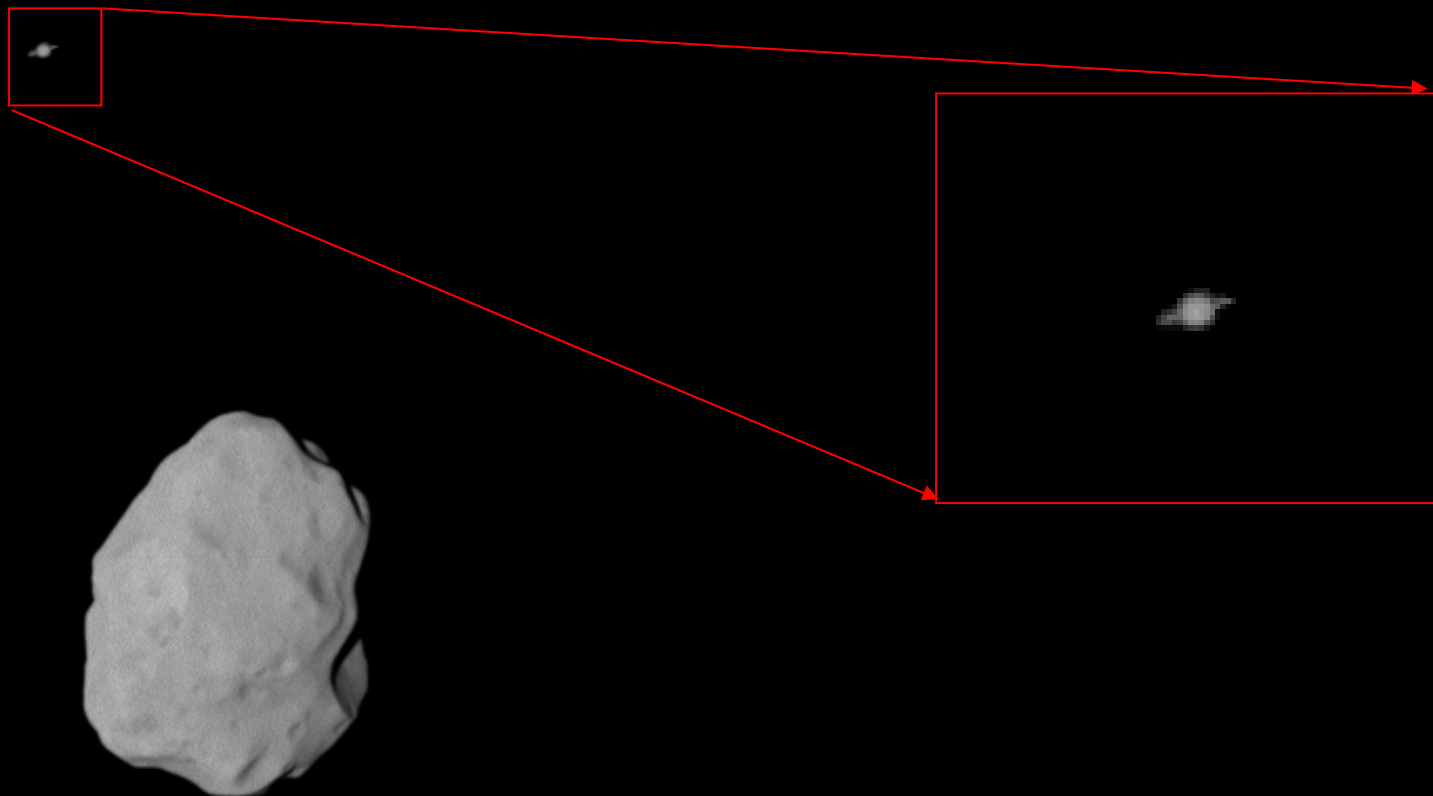
Asteroid Steins – 5/9/2008



Third Earth fly-by – 13/11/2009



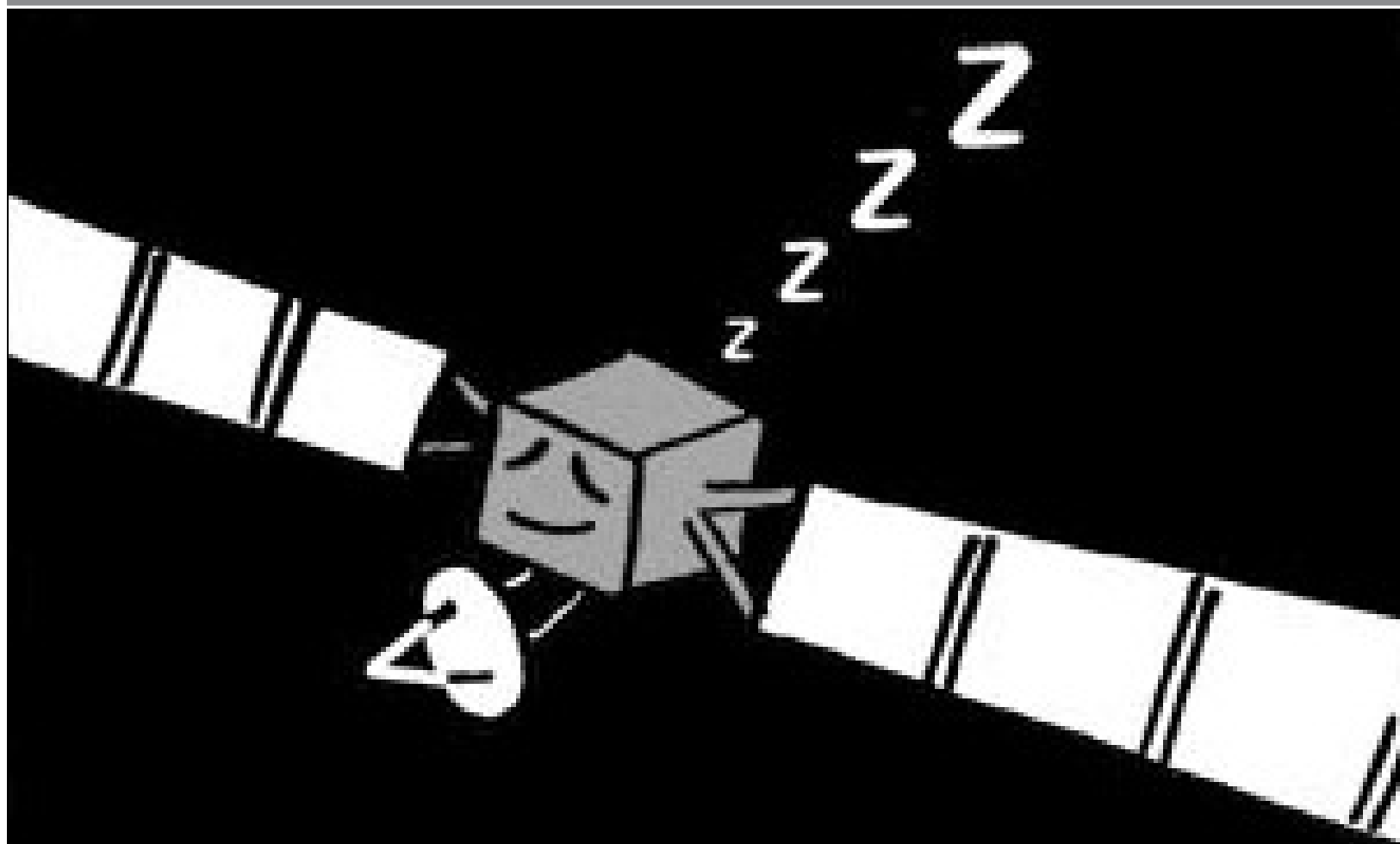
Asteroid Lutetia (with surprise!)



Asteroid Lutetia – 10/7/2010



Going into hibernation



European Space Agency

Wake-up! – live from ESOC



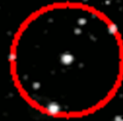
European Space Agency

Target in sight!



Credits: ESA 2010 MPS for OSIRIS Team/ MPS/ UPD/ LAM/ IAA/ RSSD/ INTA/ UPM/ DASP/ IDA

67P is waiting for us, and is active!!!



Credits: ESA 2010 MPS for OSIRIS Team/ MPS/ UPD/ LAM/ IAA/ RSSD/ INTA/ UPM/ DASR/ IDA

28th June 2014



14/7/2014: surprise!



14 July 2014
Rot = 0 deg



29/07/2014 – 2000 Km away

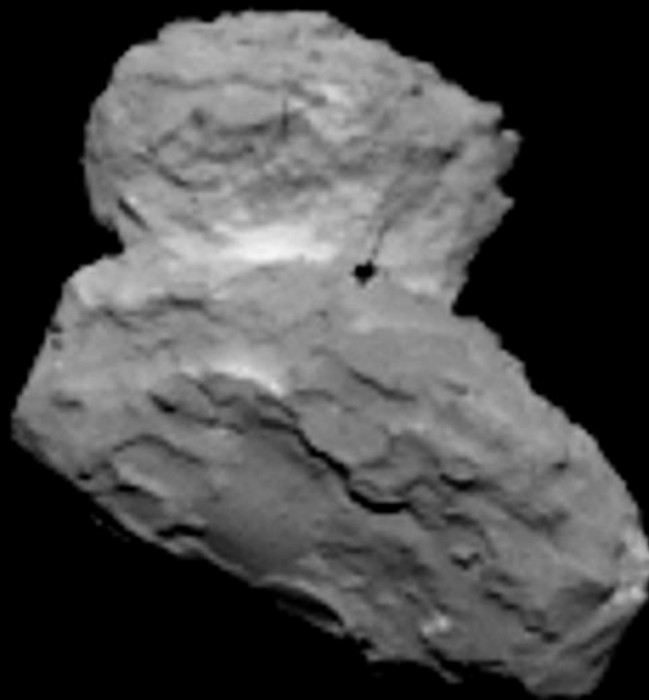


2 km

A horizontal white line serving as a scale bar, positioned directly below the '2 km' text.

ce Agency

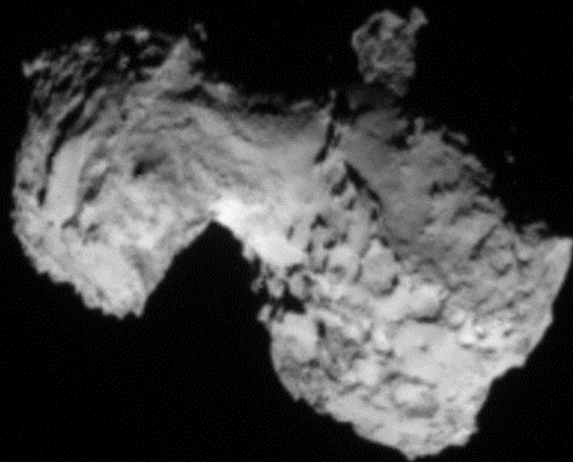
02/08/2014 – 1000 Km away



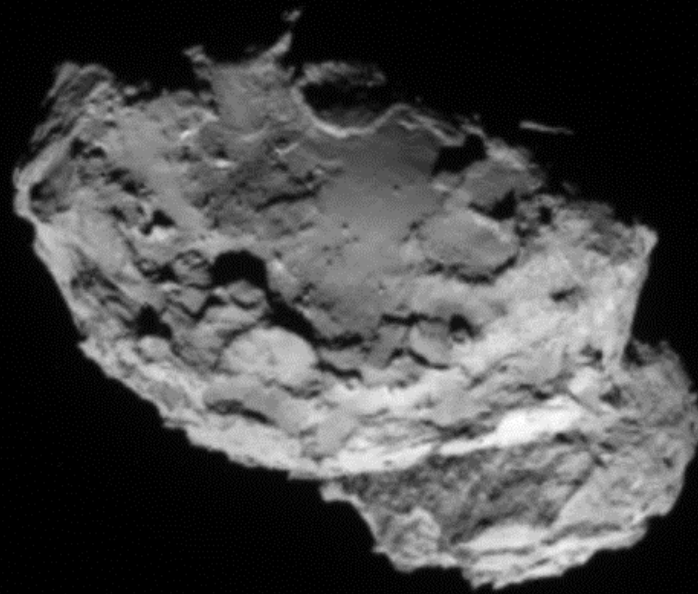
ESA

European Space Agency

03/08/2014 – 300 Km away



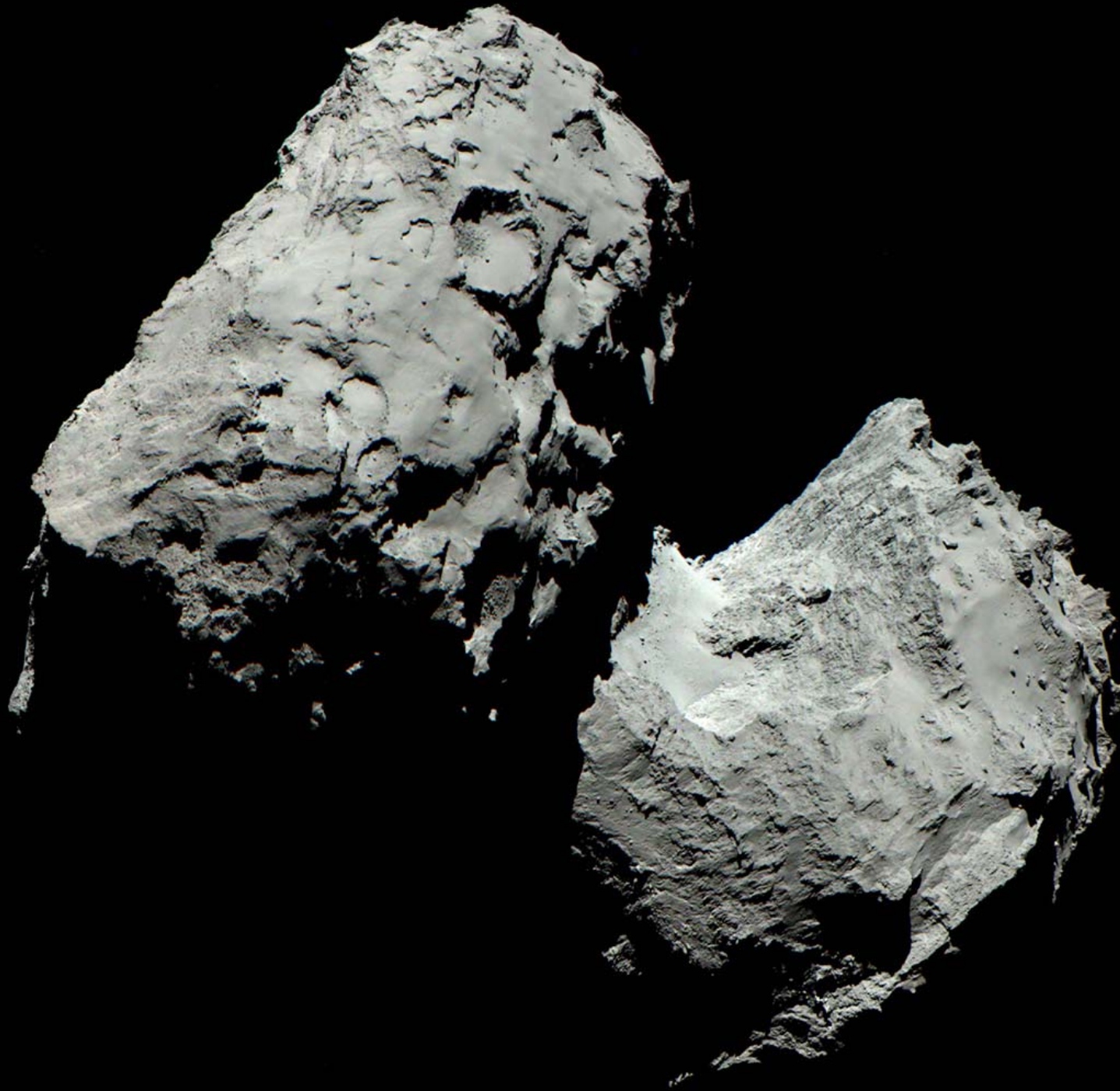
04/08/2014 – 230 Km away



Animation: Navigation Camera





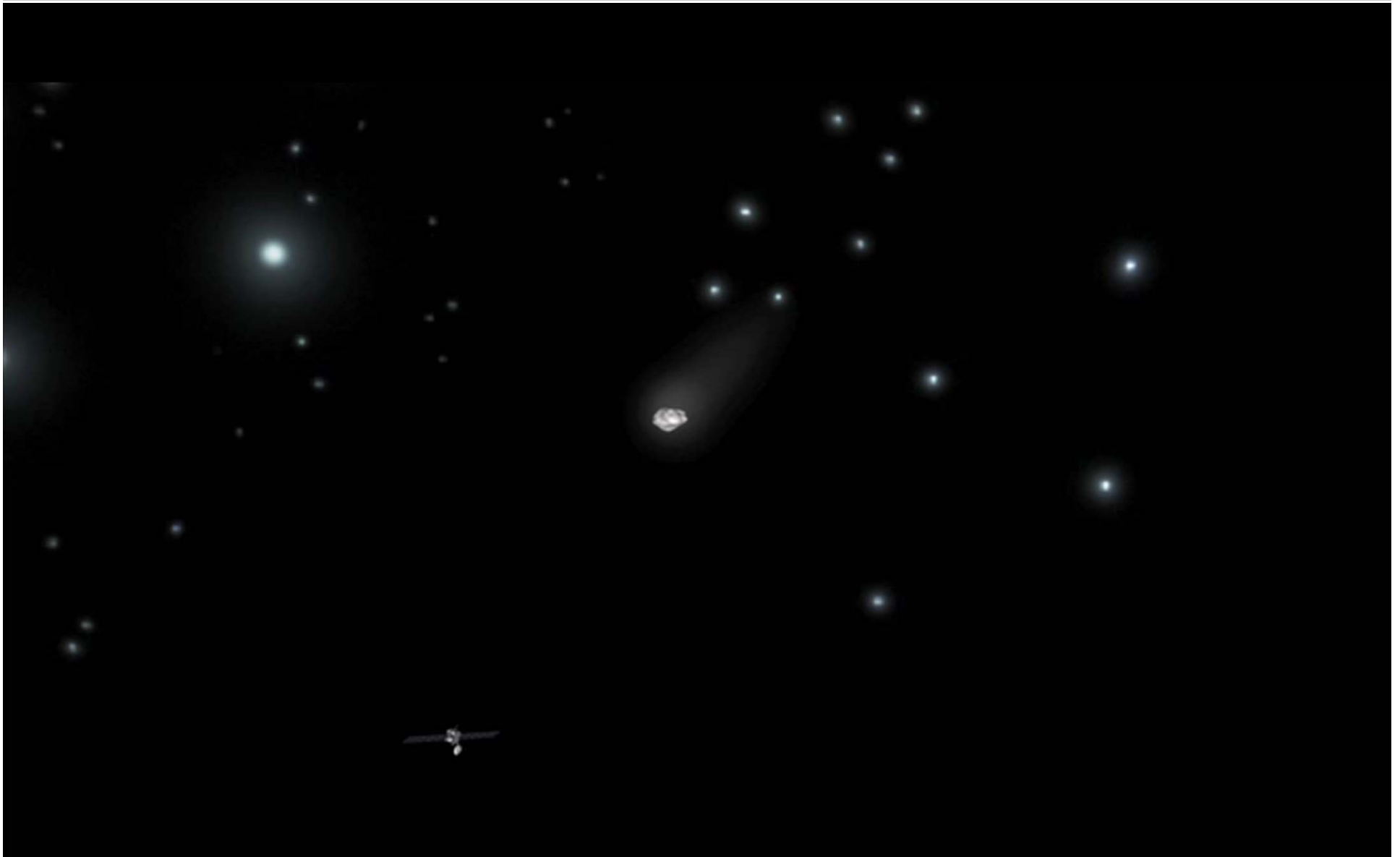


ESA

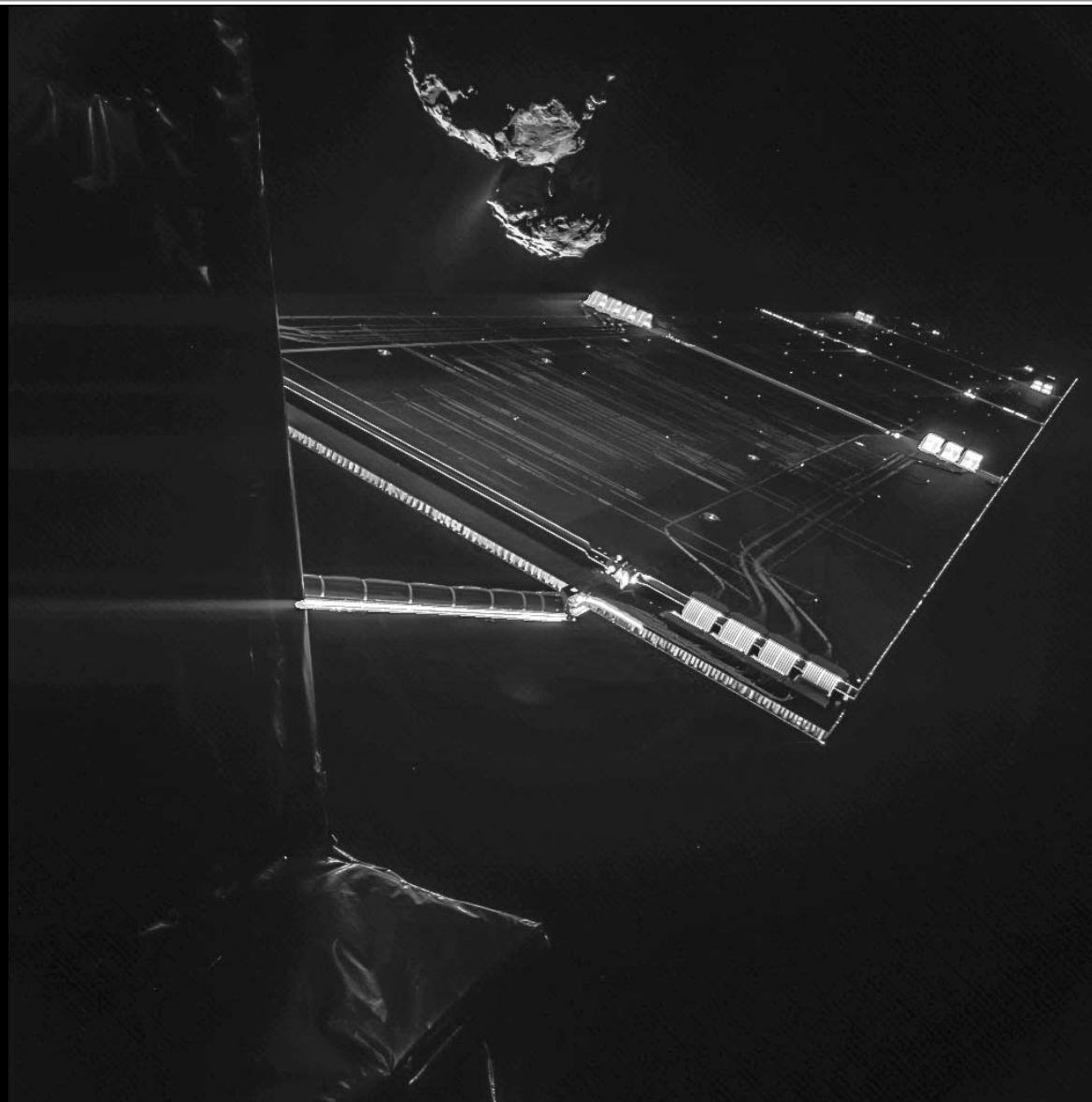
European Space Agency

Credits: ESA 20

Comet capture – entry into orbit



We are at the comet: a selfie with Chury!



How big is the comet?

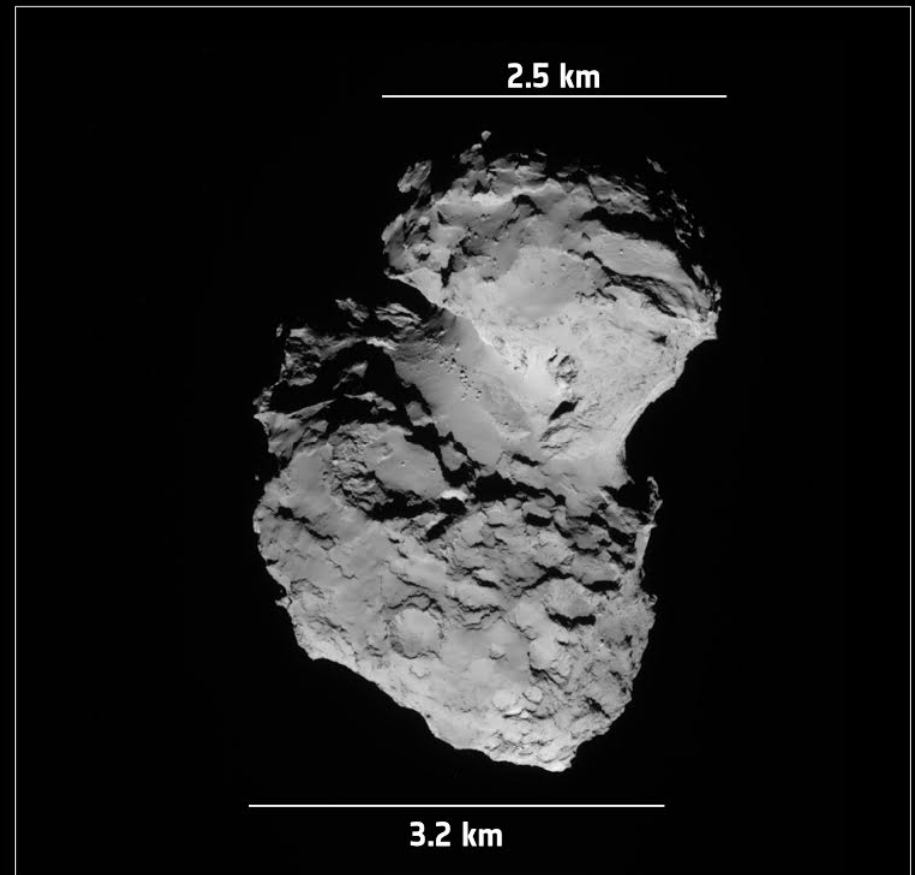
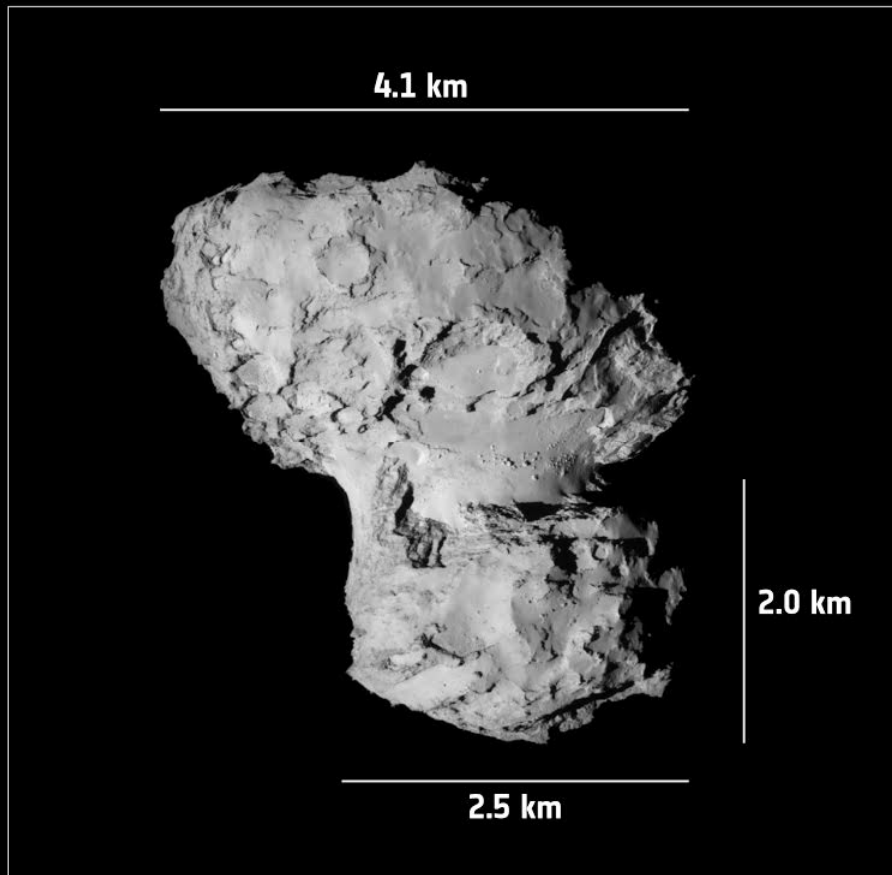


Image: ESA/Rosetta/NAVCAM; Dimensions: ESA/Rosetta/MPS for OSIRIS Team MPS/UPD/LAM/IAA/SSO/INTA/UPM/DASP/IDA

It's this big!



→ DARMSTADT

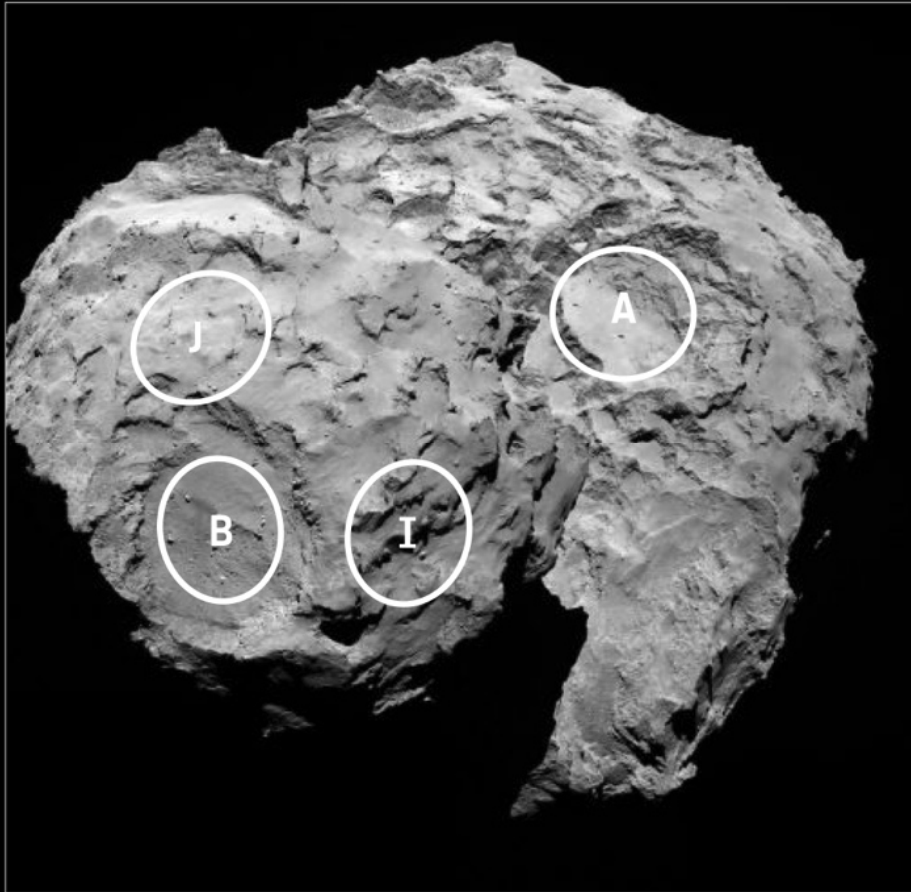


Darmstadt

Arheilgen

4100 m

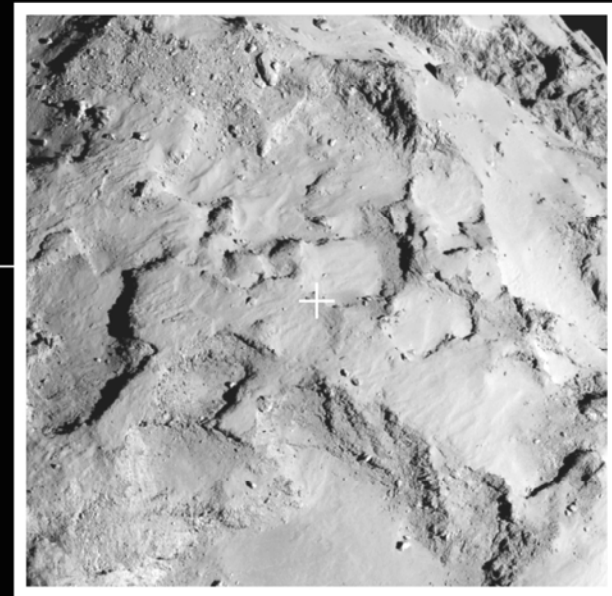
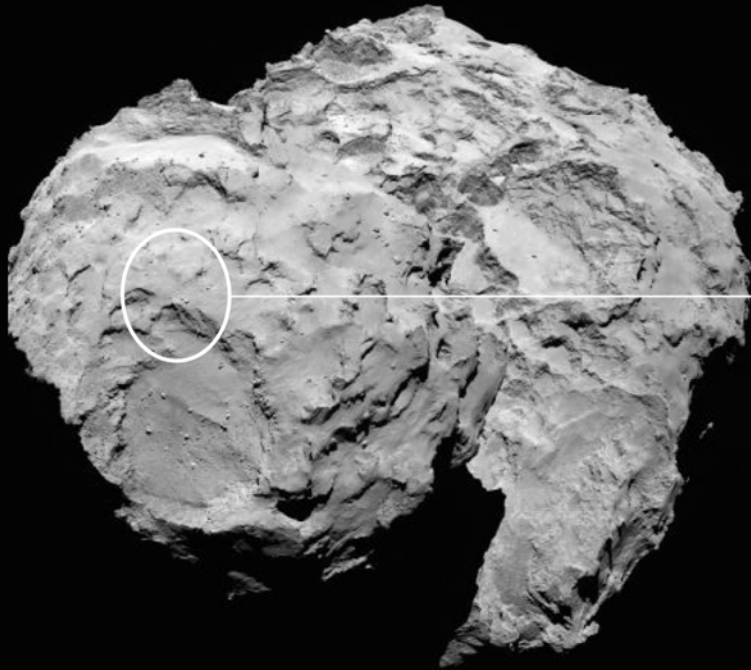
Five candidates for the landing



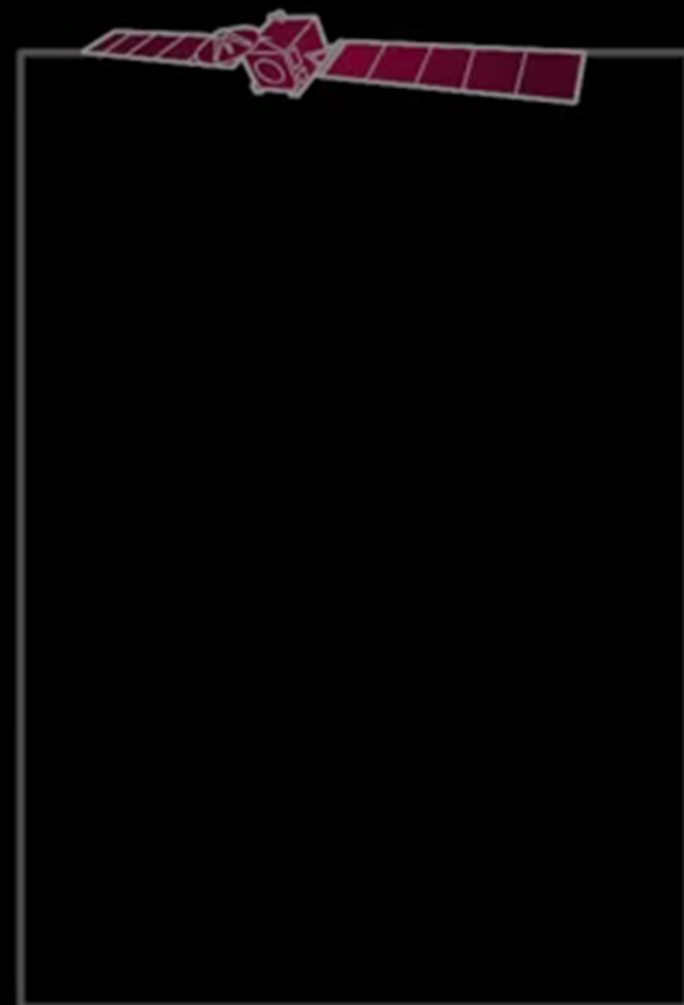
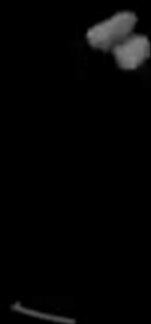
Selection of the final destination



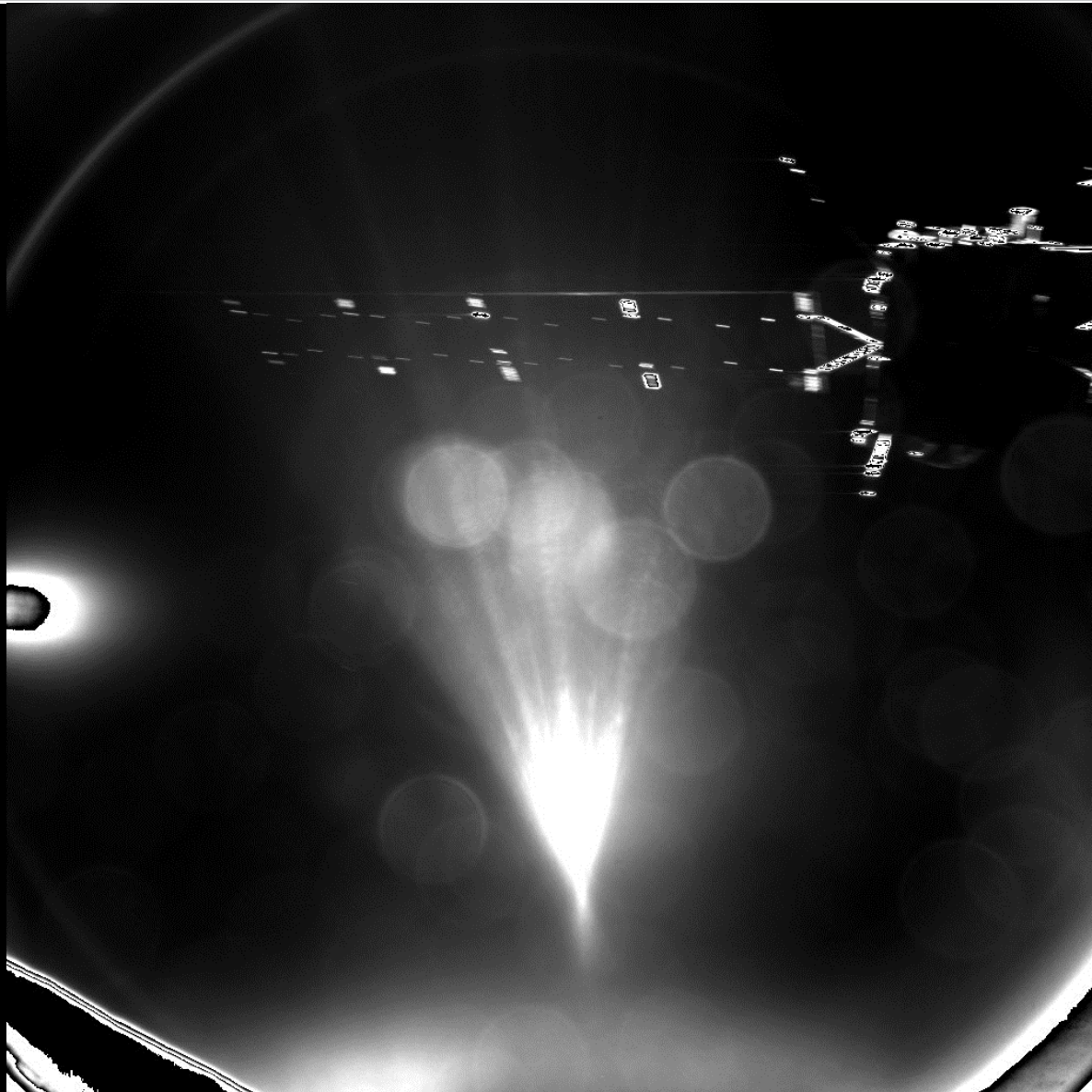
→ PHILAE'S LANDING SITE



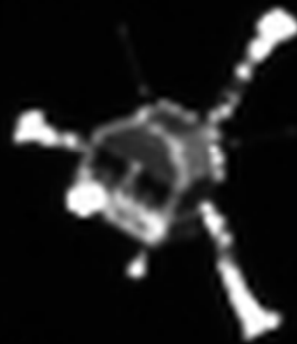
Lander separation and descent to the comet



Farewell Rosetta!



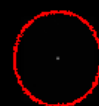
Farewell Philae!



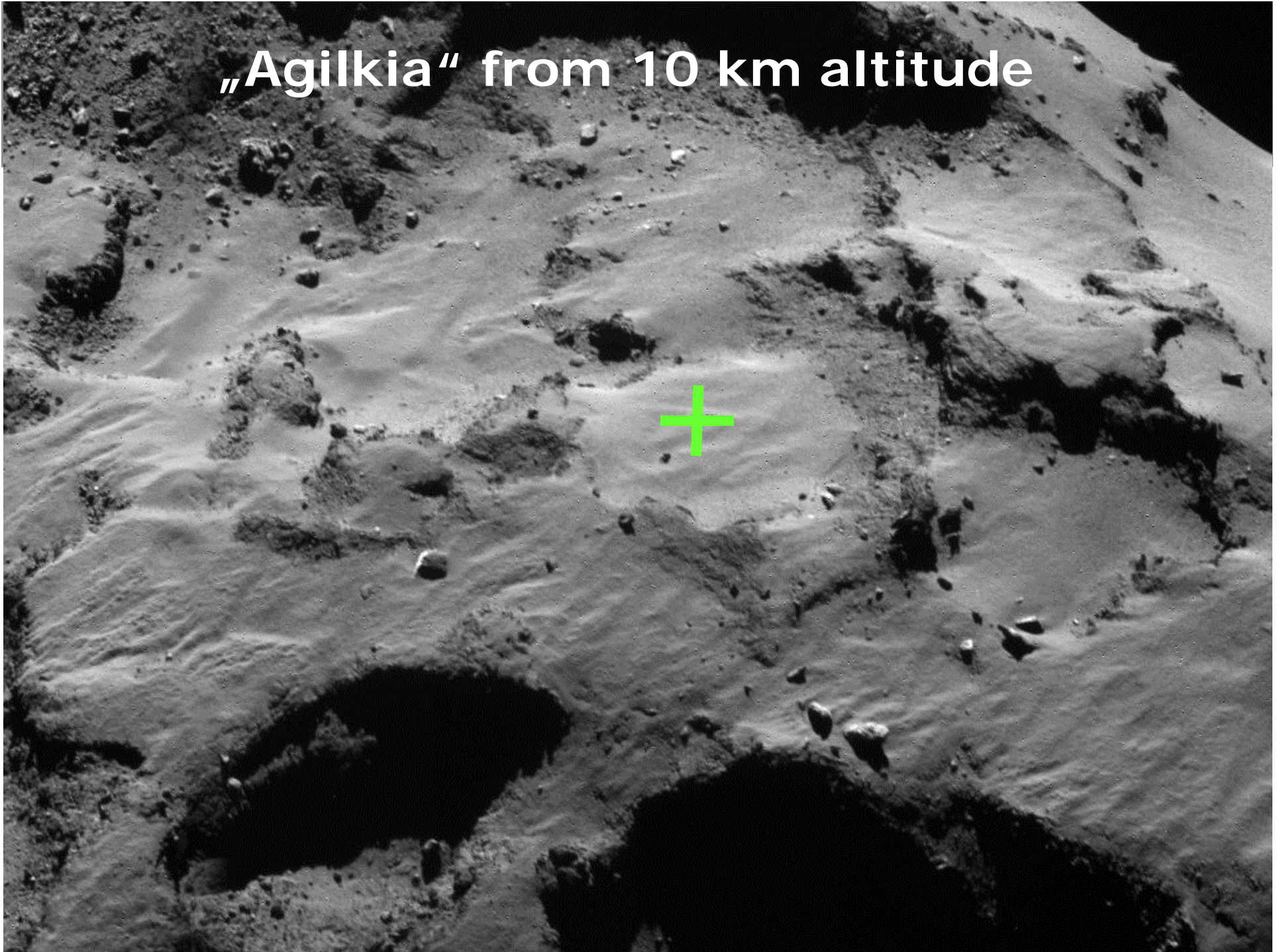
Have a nice trip and...



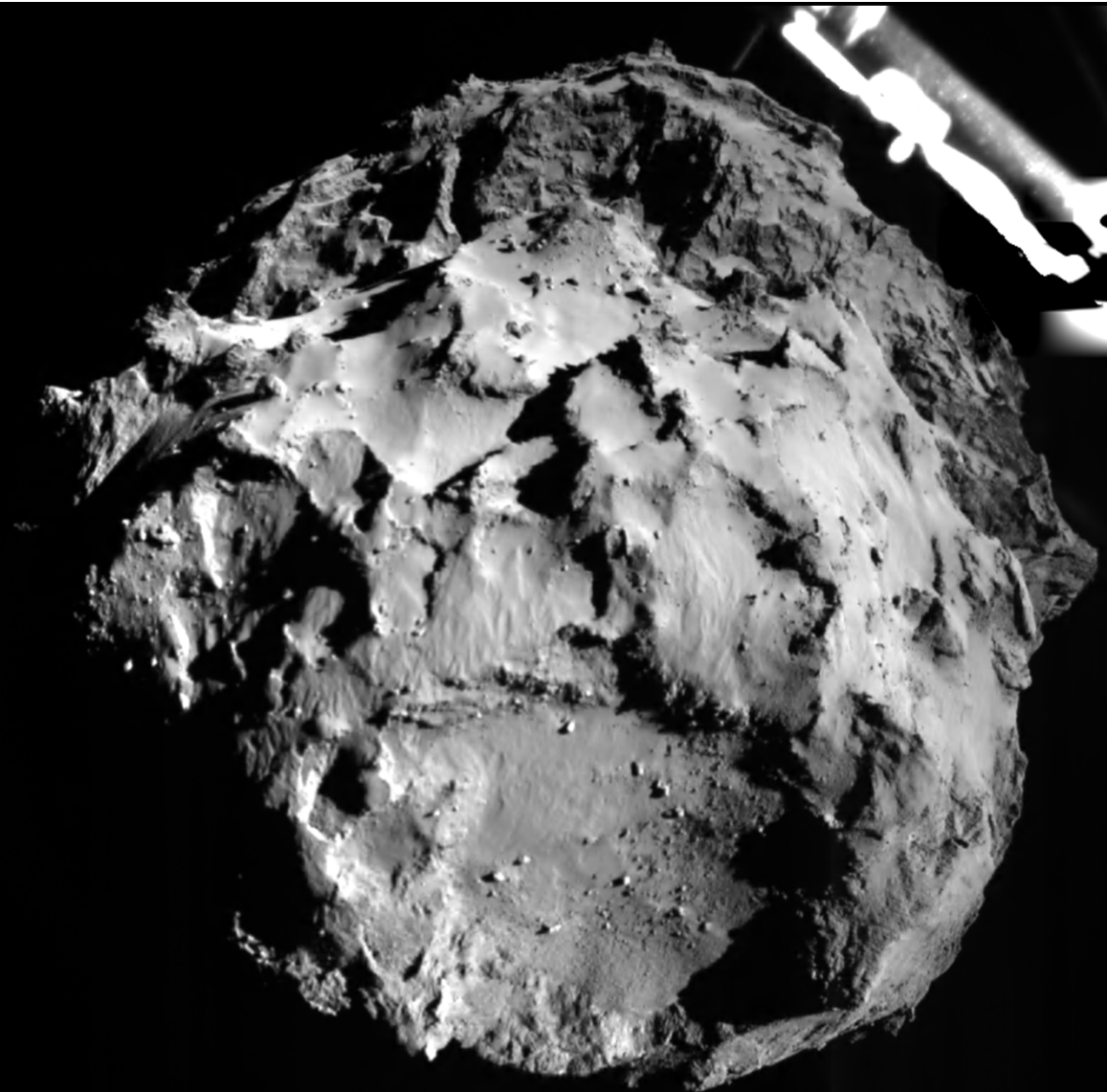
...a happy landing!!!



„Agilkia“ from 10 km altitude



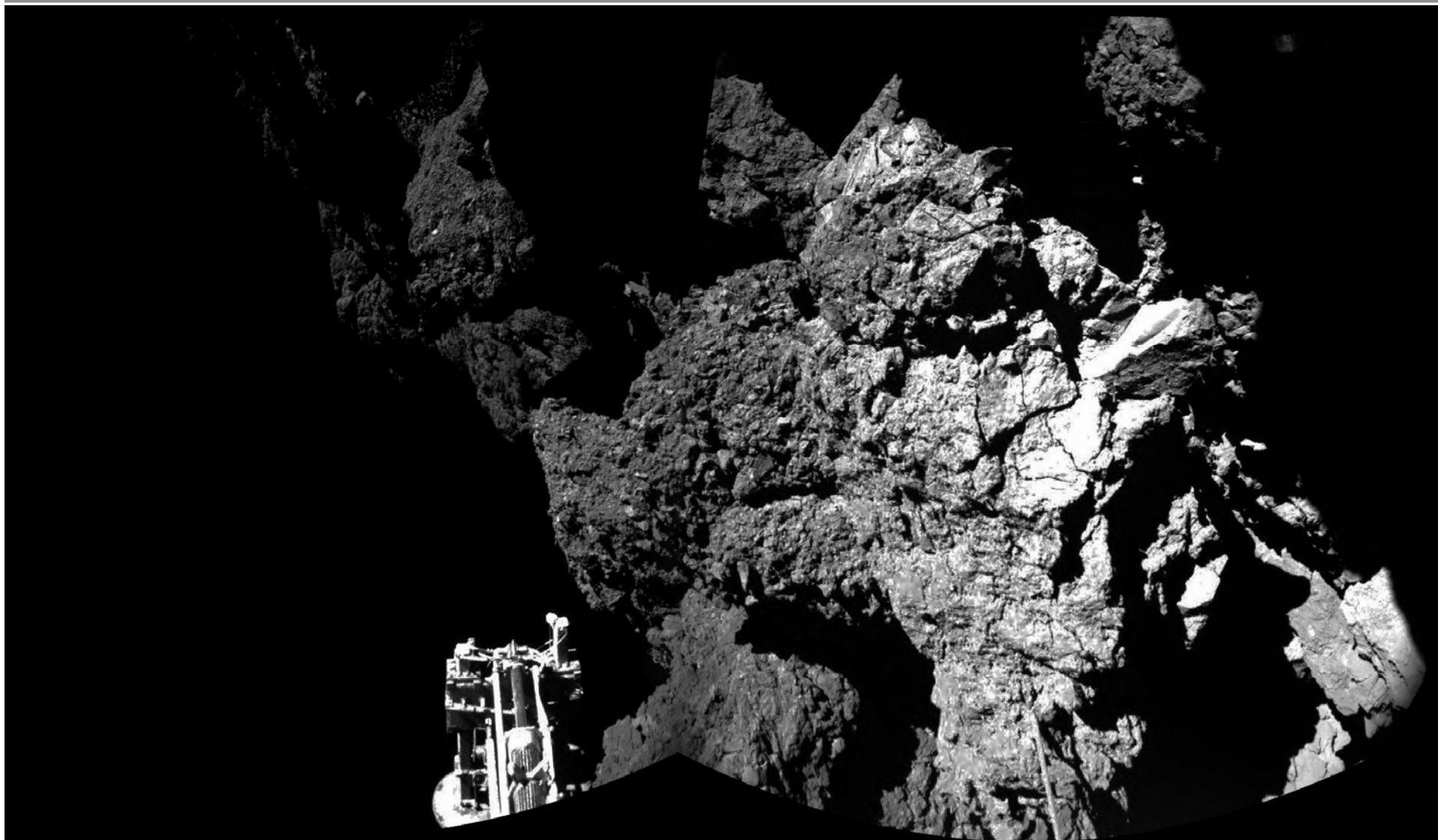
Approaching...



40 metres from the ground...



First picture from the surface of a comet!



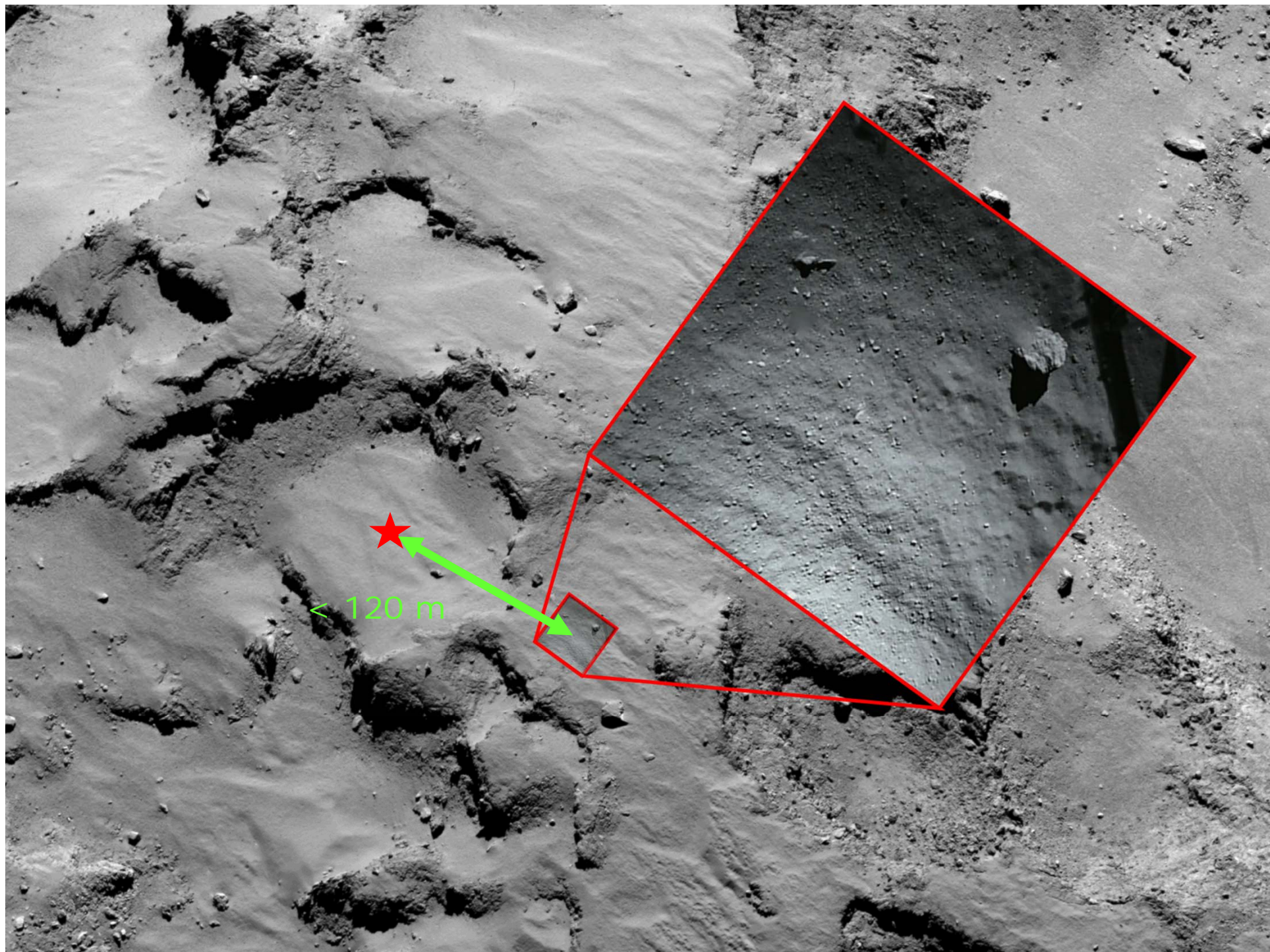
ESA / Rosetta / Philae / CIVA



ESA / Rosetta / Philae / CIVA

Landing procedure

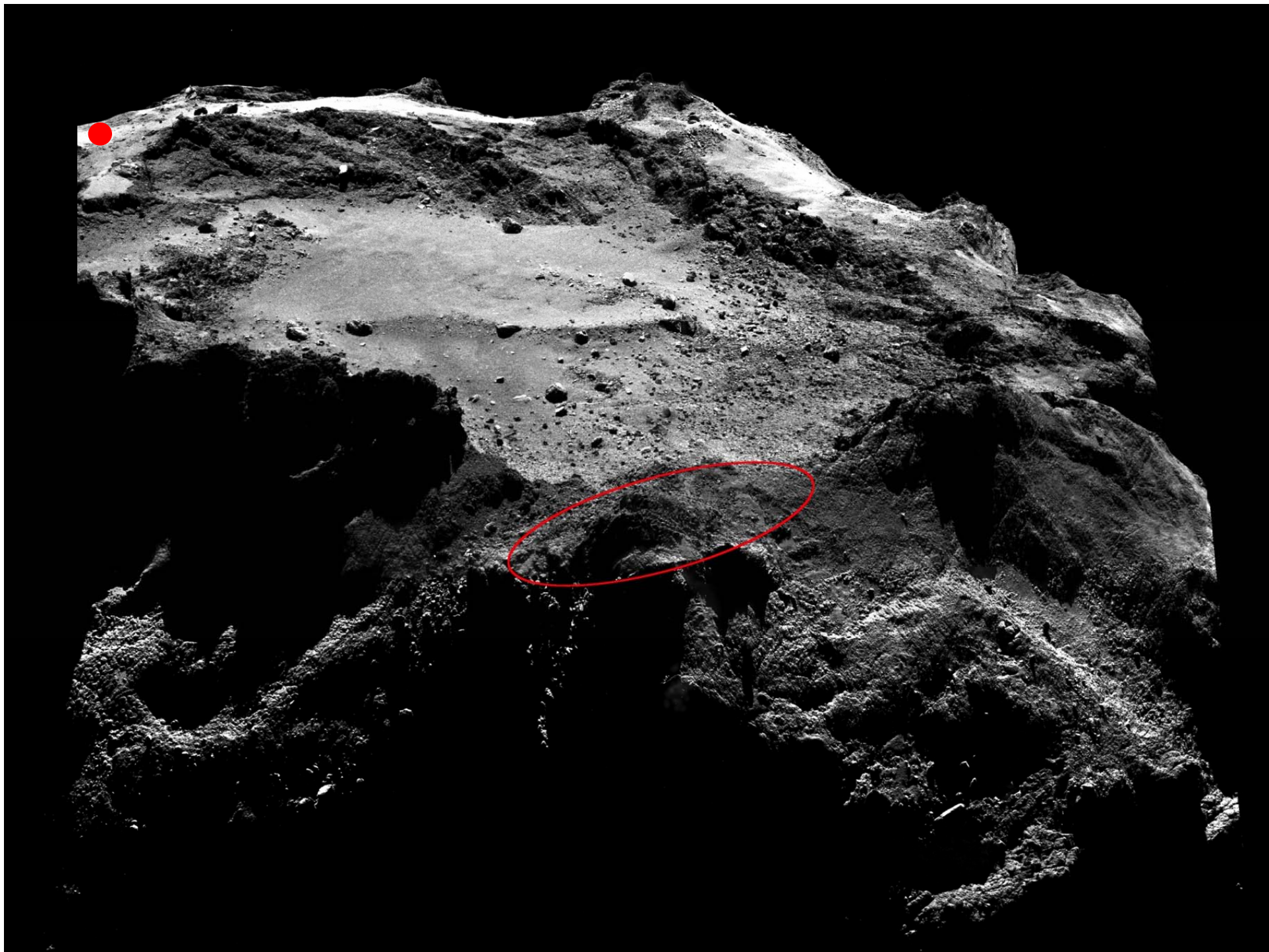






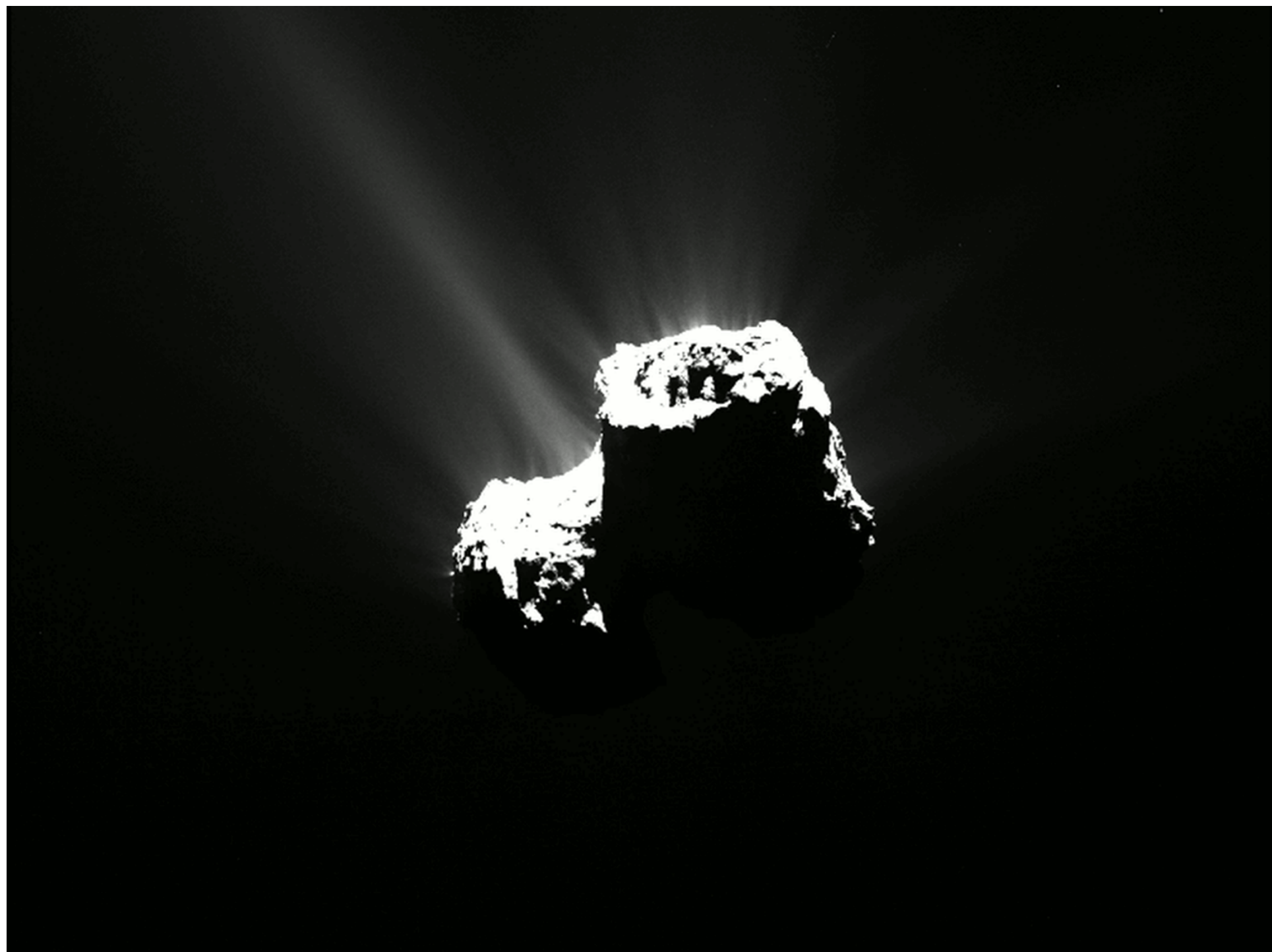
Do you spot anything wrong?

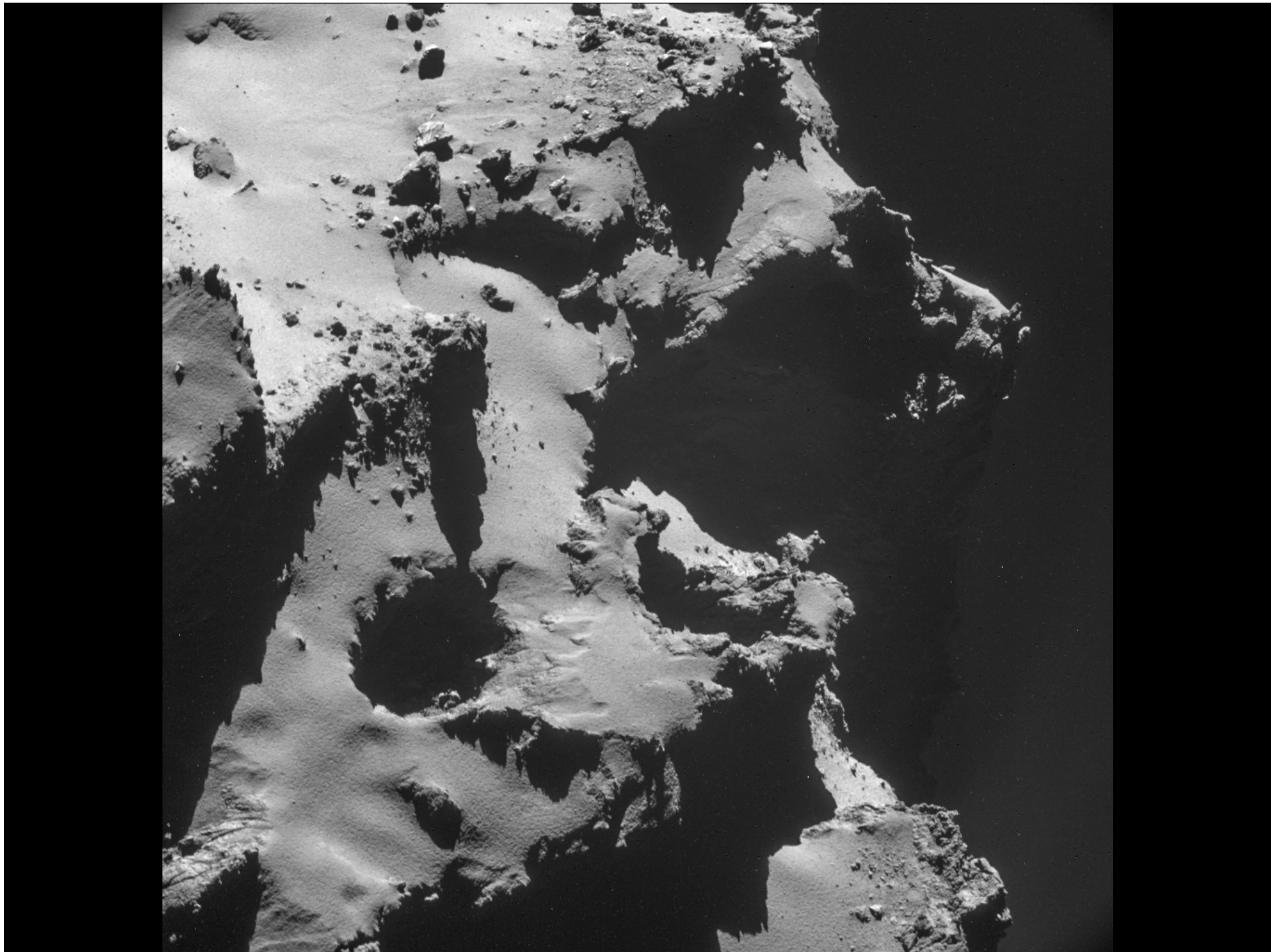




Philae – scientific activity



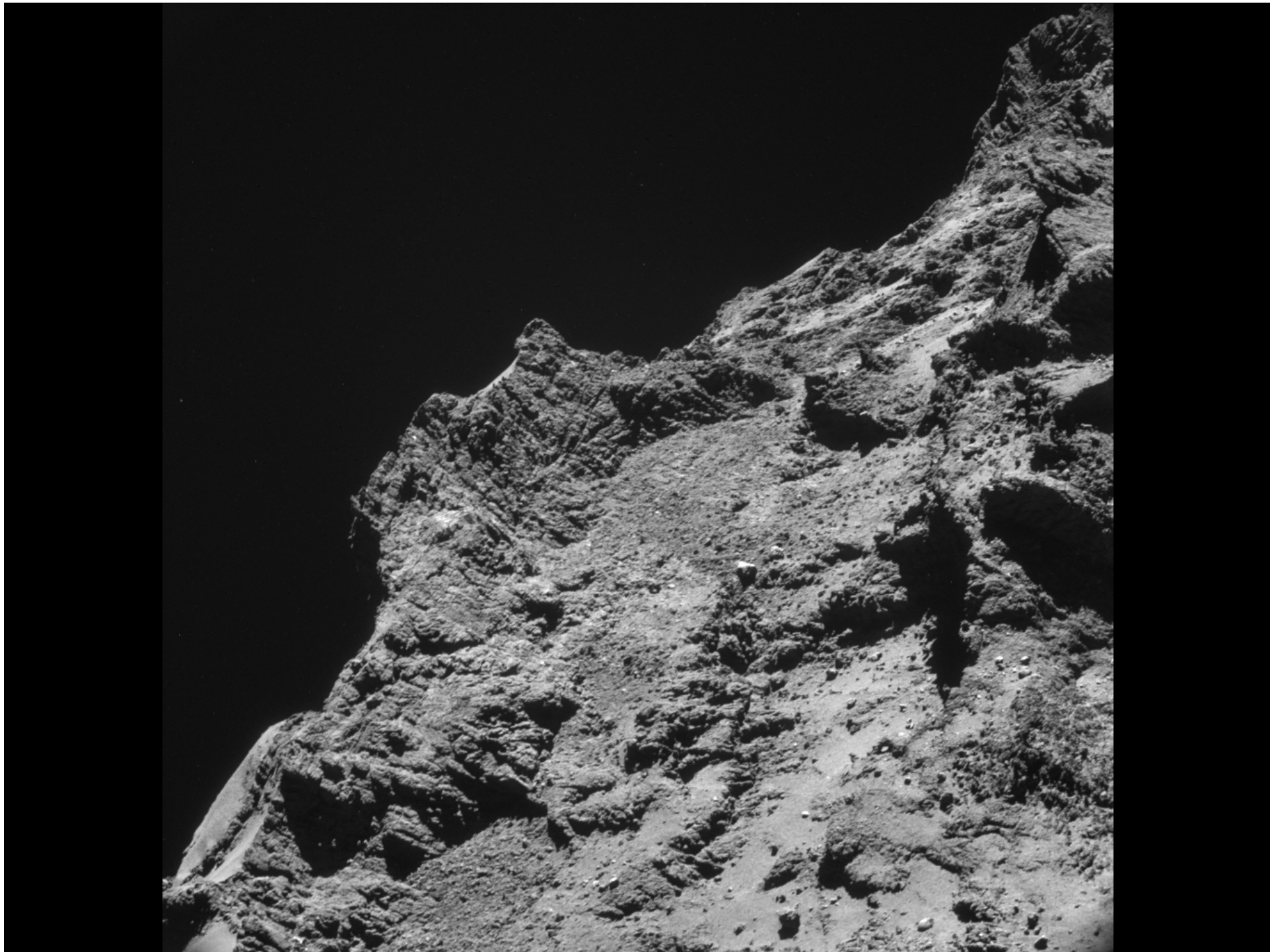


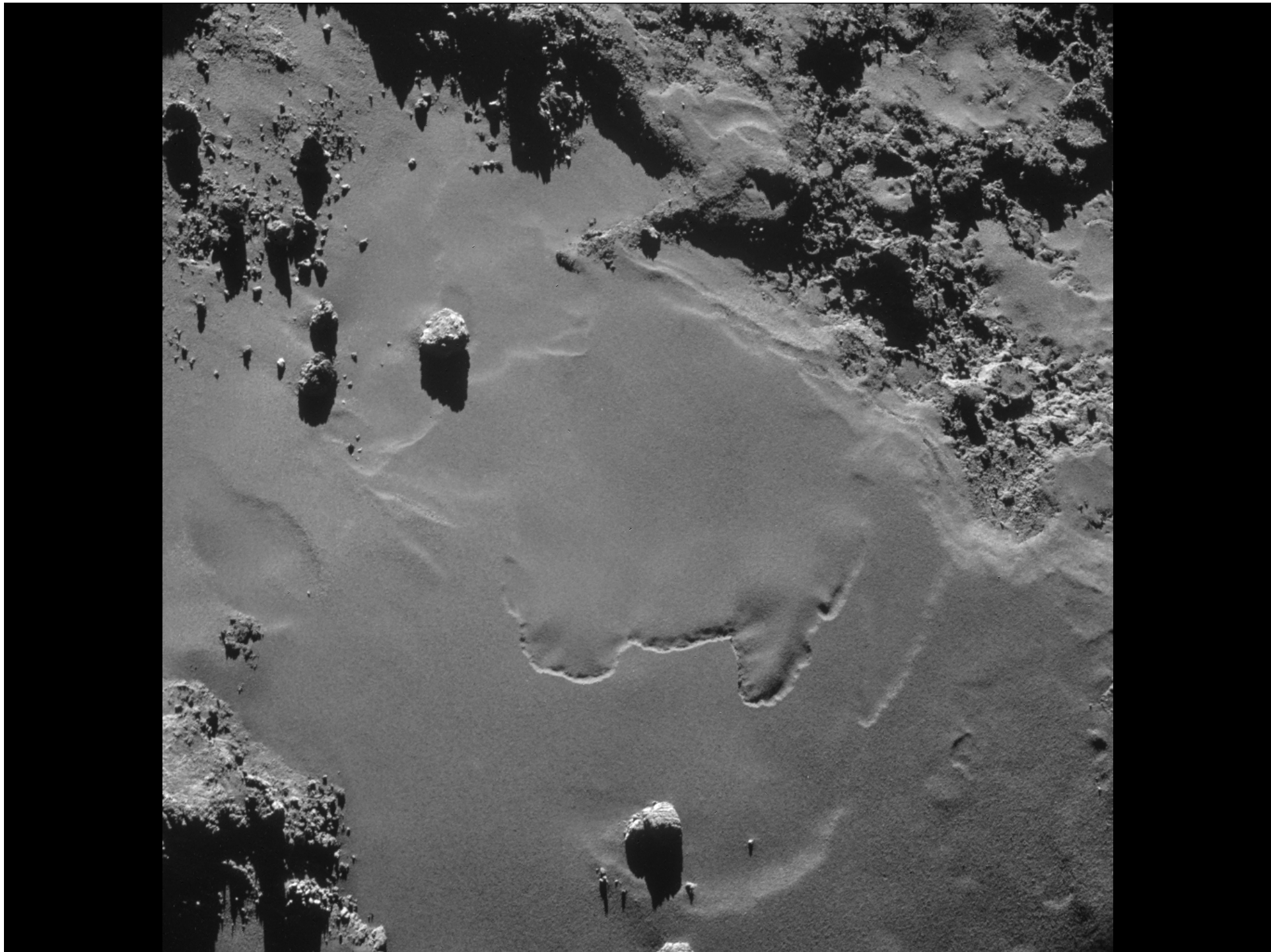


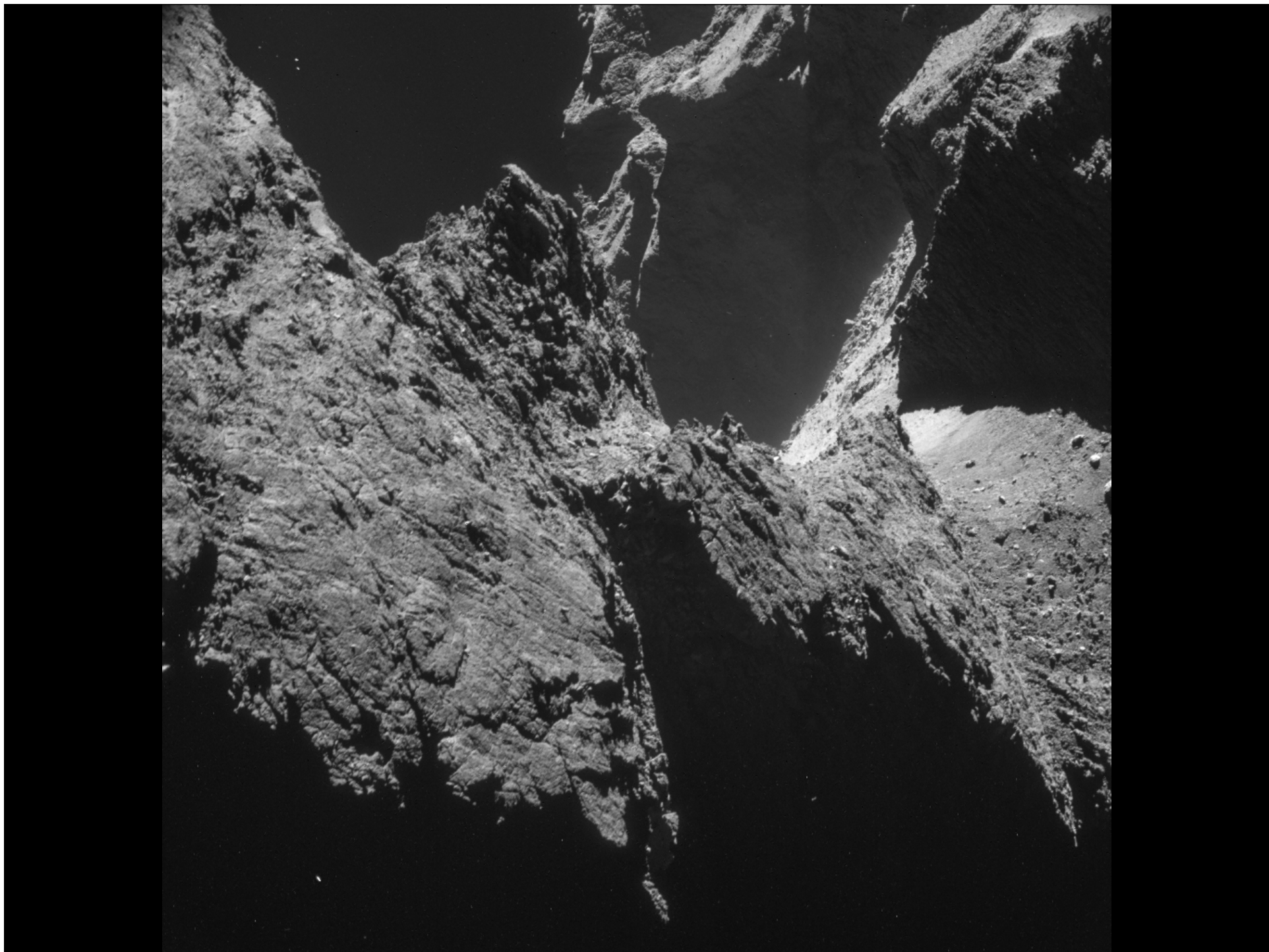


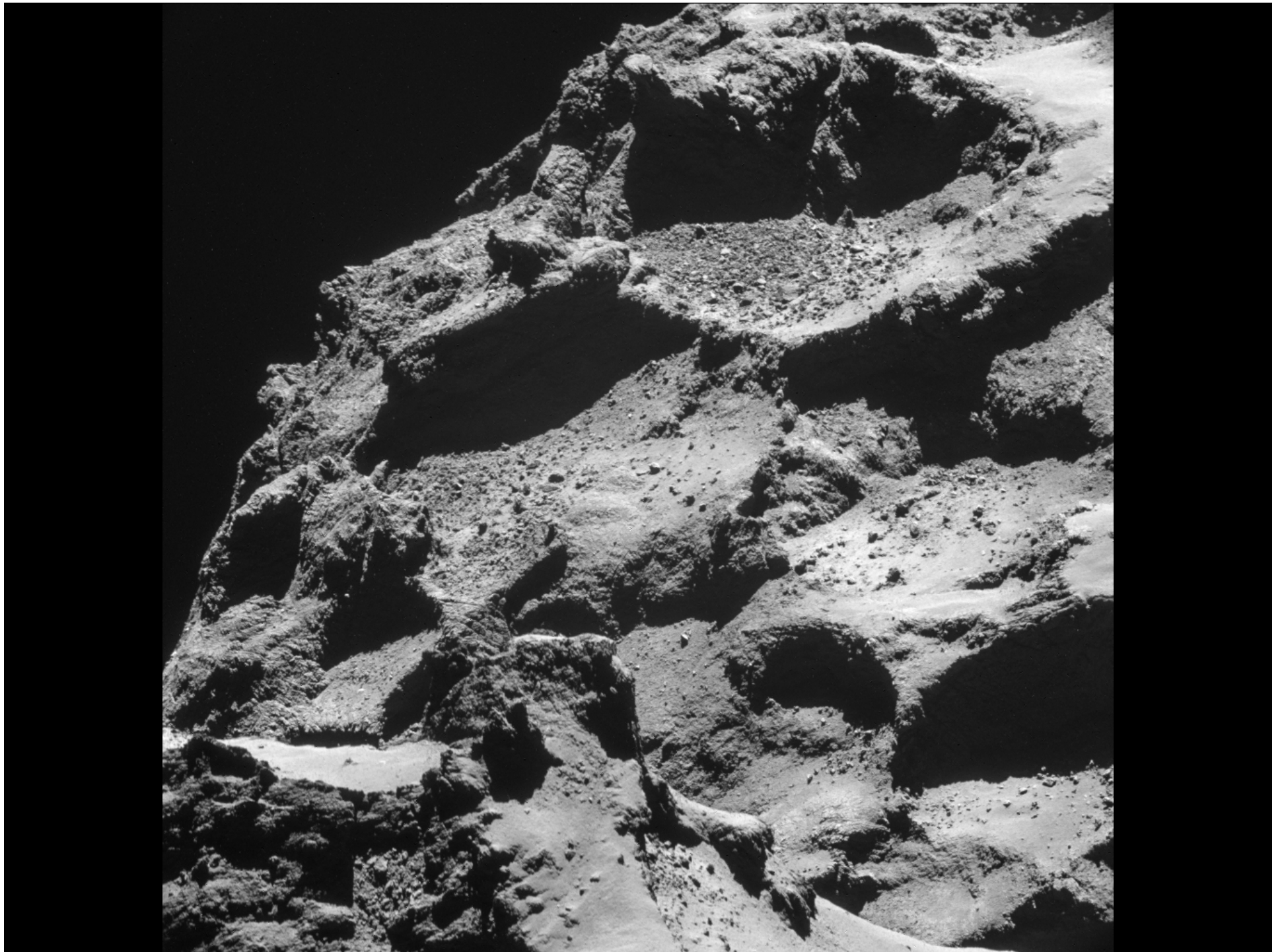


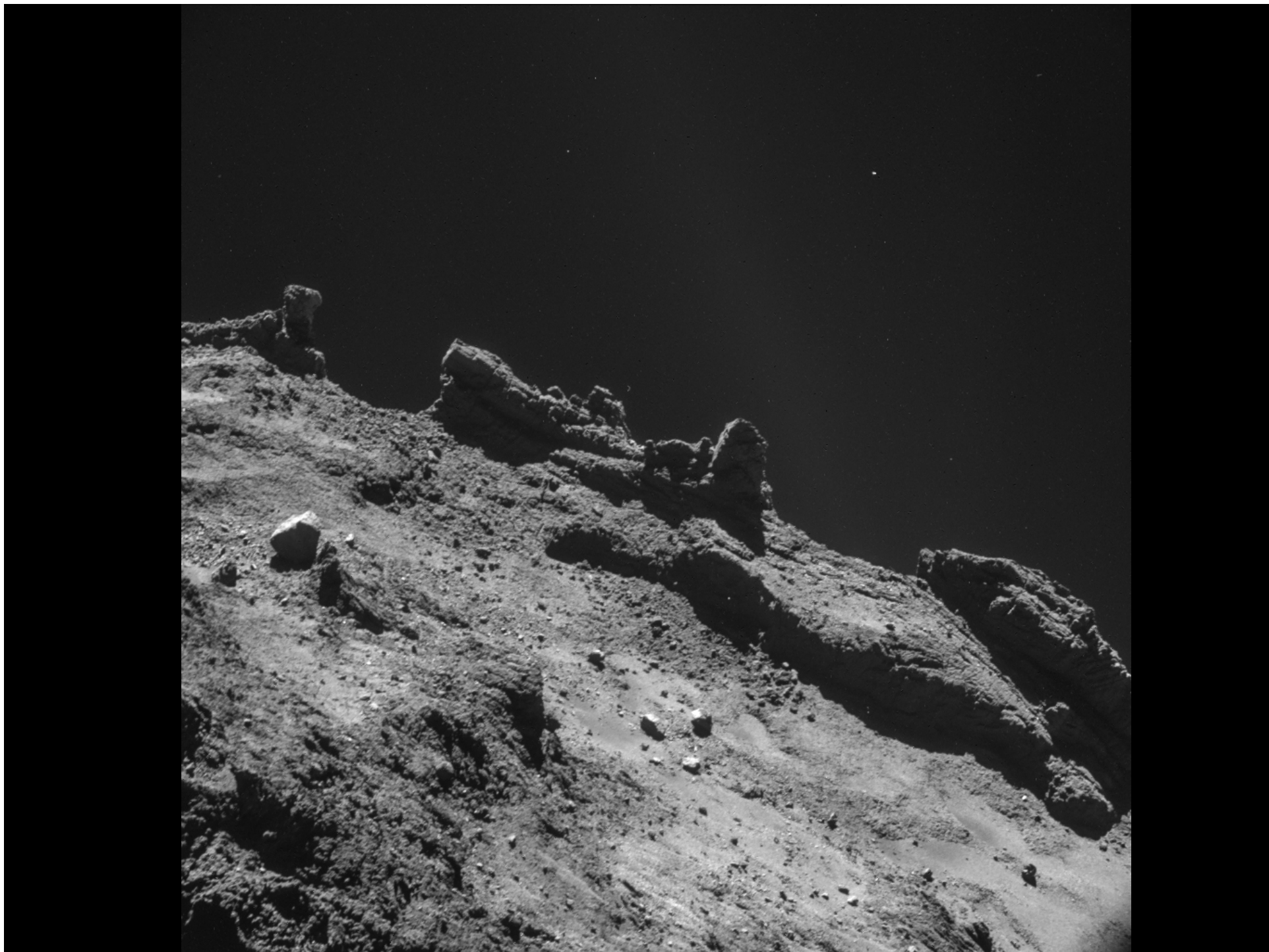
A peak on 67P/C-G / ESA/Rosetta/MPS for OSIRIS Team

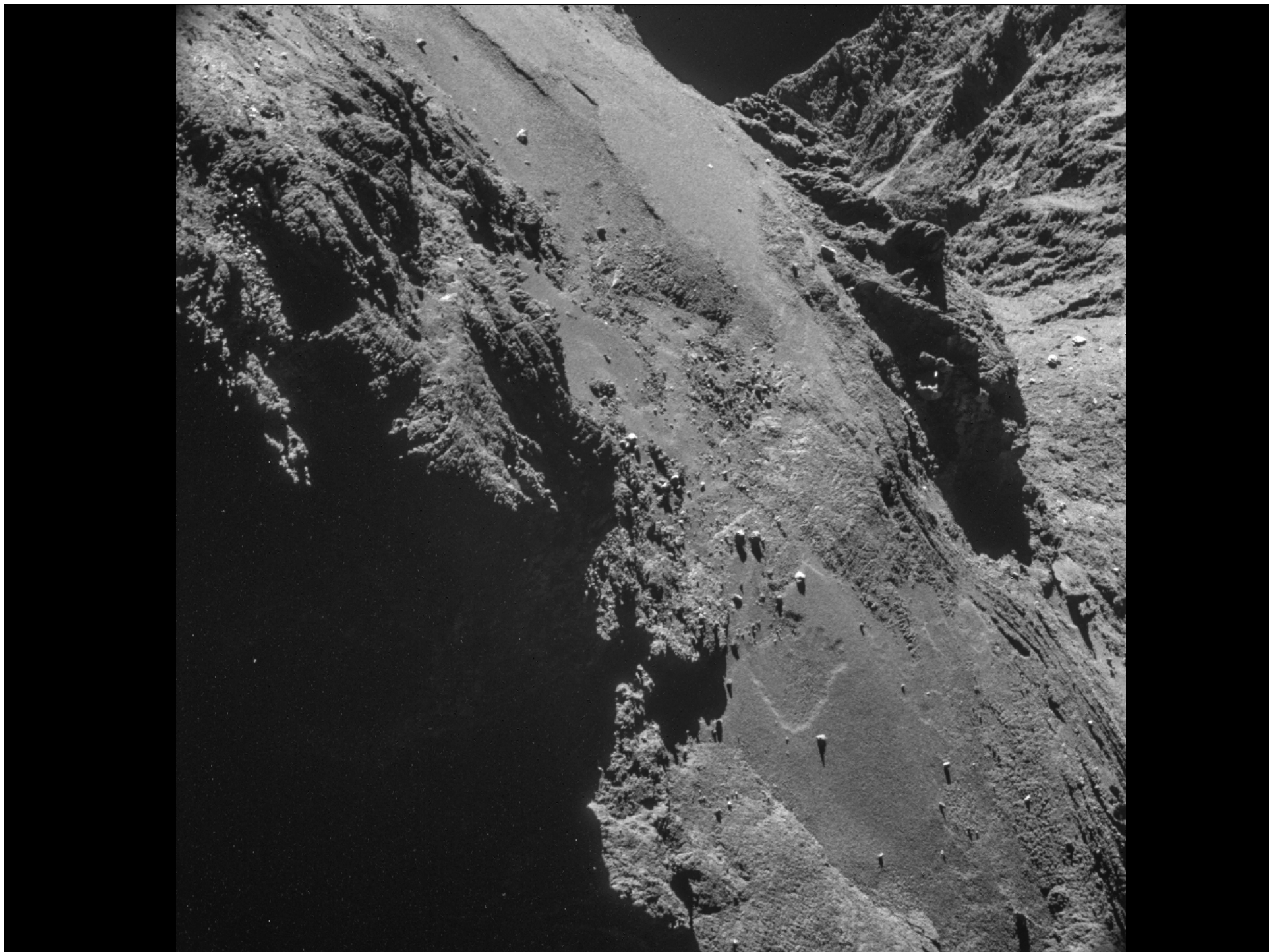














To follow the mission

Website : www.esa.int/Rosetta

Blog : blogs.esa.int/Rosetta

Facebook : RosettaMission

Twitter : @ESA_Rosetta

Purpose of ESA



“To provide for and promote, for exclusively peaceful purposes, cooperation among European states in **space research** and **technology** and their **space applications**.”

Article 2 of ESA Convention



ESA facts and figures



- Over 50 years of experience
- 22 Member States
- Eight sites/facilities in Europe, about 2200 staff
- 5.2 billion Euro budget (2016)
- Over 80 satellites designed, tested and operated in flight



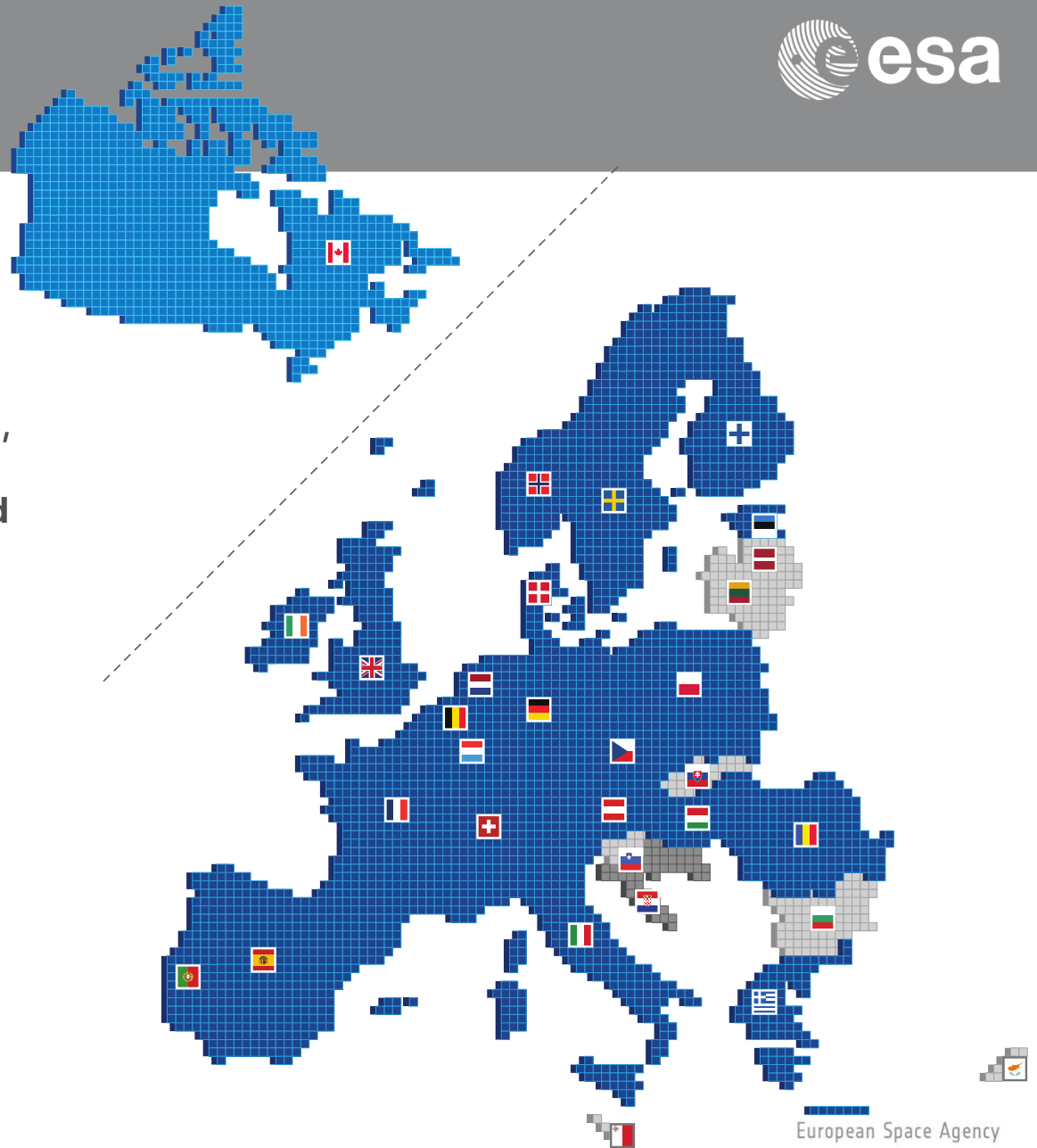
Member States



ESA has 22 Member States:
20 states of the EU (AT, BE, CZ, DE, DK, EE, ES, FI, FR, IT, GR, HU, IE, LU, NL, PT, PL, RO, SE, UK) plus Norway and Switzerland.

Seven other EU states have Cooperation Agreements with ESA: Bulgaria, Cyprus, Latvia, Lithuania, Malta, Slovakia and Slovenia. Discussions are ongoing with Croatia.

Canada takes part in some programmes under a long-standing Cooperation Agreement.



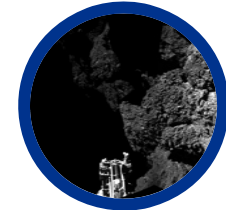
Activities



space science

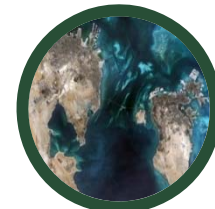


human spaceflight



exploration

1.ESA is one of the few
space agencies in the
world
to combine responsibility
in nearly all areas
of space activity.



earth observation



launchers



navigation



operations



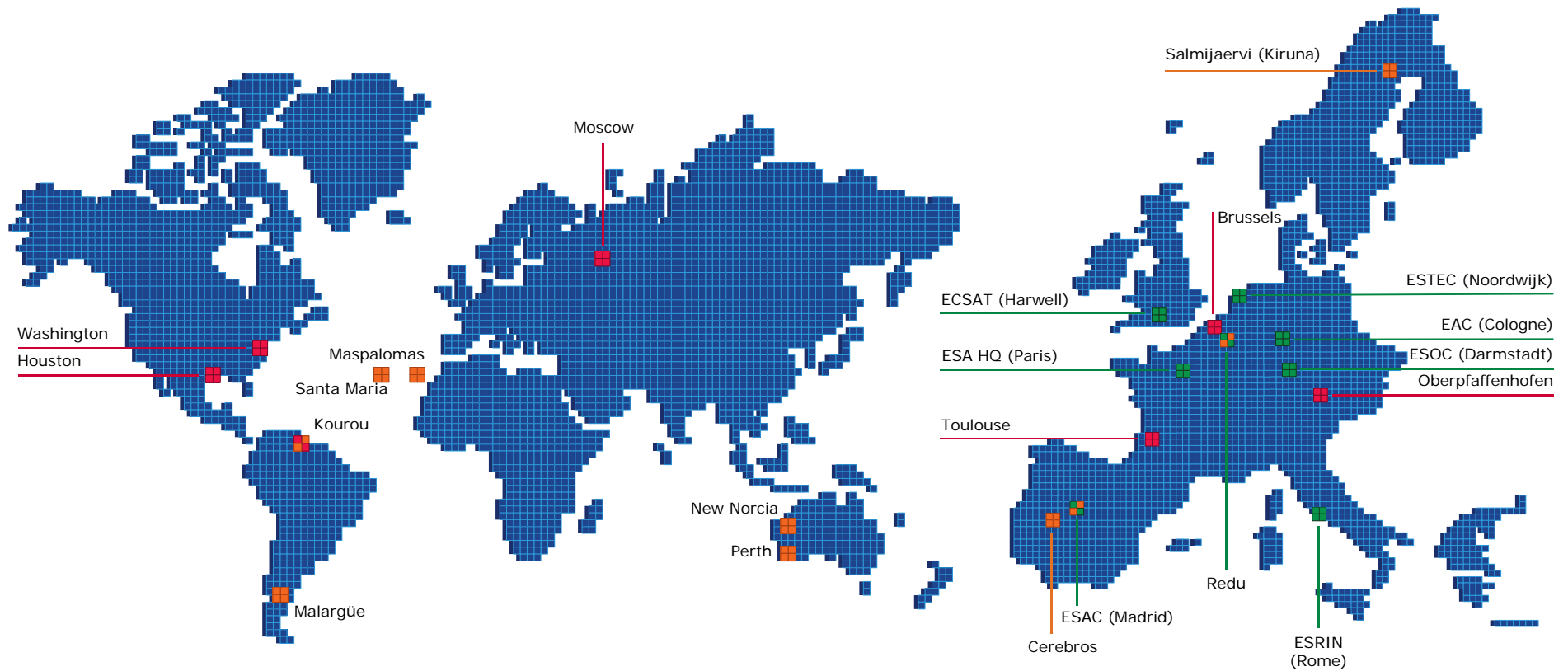
technology



telecommunications

* Space science is a Mandatory programme, all Member States contribute to it according to GNP. All other programmes are Optional, funded 'a la carte' by Participating States.

ESA's locations



- ESA sites
- Offices
- ESA Ground Station
- ESA Ground Station + Offices
- ESA sites + ESA Ground Station

Wake up: 20th January 2014



ESOC Main control room



2014



2004





Thank you!

Alessandro.ercolani@esa.int



European Space Agency