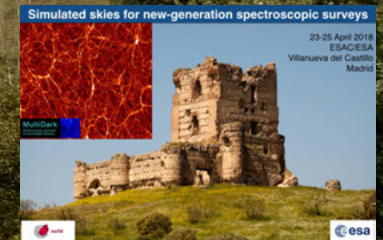




Welcome to ESA and ESAC: "Simulated skies for new-generation spectroscopic surveys"

Martin Kessler,

ESAC, 23 April 2018



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European Space Agency

ESAC: History and Current Activities



- 1978: Opening of ESA **VIL**lafranca **SPA**in Satellite Tracking Station, VILSPA.
- 1970s, 1980s, 1990s: Support various astronomy missions.
- Early 2000's: Expansion to planetary missions.
- 2005 – Cebreros Deep Space Antenna inaugurated.
- 2008: VILSPA became ESAC, **European Space Astronomy Centre**.



ESAC'S **main activities** now:

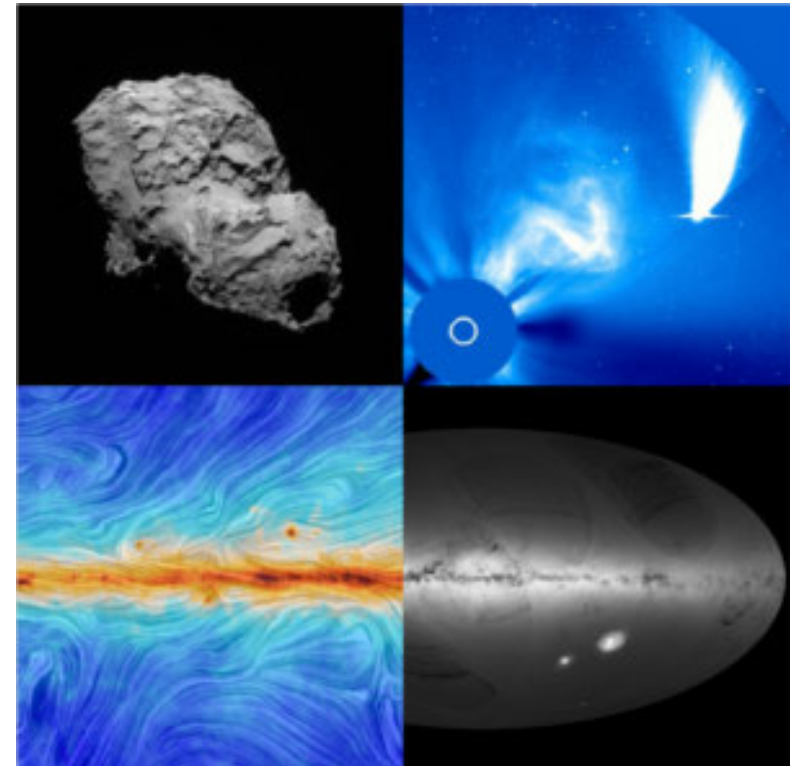
- Satellite Tracking,
- Earth Observation:
 - SMOS Spanish National Centre,
- INTA/CSIC Astrobiology Centre,
- Contribution to Space Situational Awareness,
- Galileo Navigation Science Office,
- ESAC Communication Office,
- Education activities,
- **Space science missions:**
 - **Science ops, archives, in-orbit management.**



ESA's Space Science Programme ...



- is driven by science and the scientific community,
- enables Europe to achieve scientific excellence,
- contributes to sustainability of European space skills, capabilities and infrastructures,
- is participated in by all Member States: mandatory programme,
- is planned long-term.



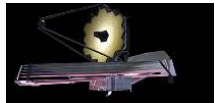
Missions in Preparation (in launch date order)



2018 BepiColombo (Closing in on Mercury)



2019 CHEOPS (**CH**aracterising **ExO**Planet **Sat**ellite)



2020 JWST (Observing the First Light)



2020 Solar Orbiter (Closest to the Sun)



2021 Euclid (Mapping the geometry of the Dark Universe)



2022 JUICE (**JU**piter **ICy** Moons **E**xplorer)



2026 PLATO (**PLA**netary **T**ransits and **O**scillations of Stars)



Missions in Flight (in launch date order)



1990 Hubble Space Telescope (UV/Optical/NIR Observatory)



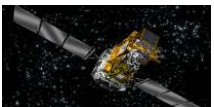
1995 SOHO (Solar and Heliospheric Observatory)



1999 XMM-Newton (X-ray Observatory)



2000 Cluster (Sun-Earth Environment)



2002 INTEGRAL (Gamma-ray Observatory)



2003 Mars Express



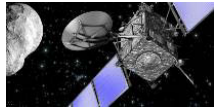
2009 PROBA-2 (technology demonstrator and solar observations)



2013 Gaia (astrometry – charting a billion stars) – **DR2 this week!**



Missions in Post-Operations (in launch date order)



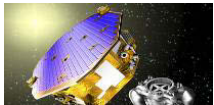
2004 Rosetta (Cometary exploration)



2009 Herschel (Far-infrared Observatory)



2009 Planck (Mapping cosmic microwave background)

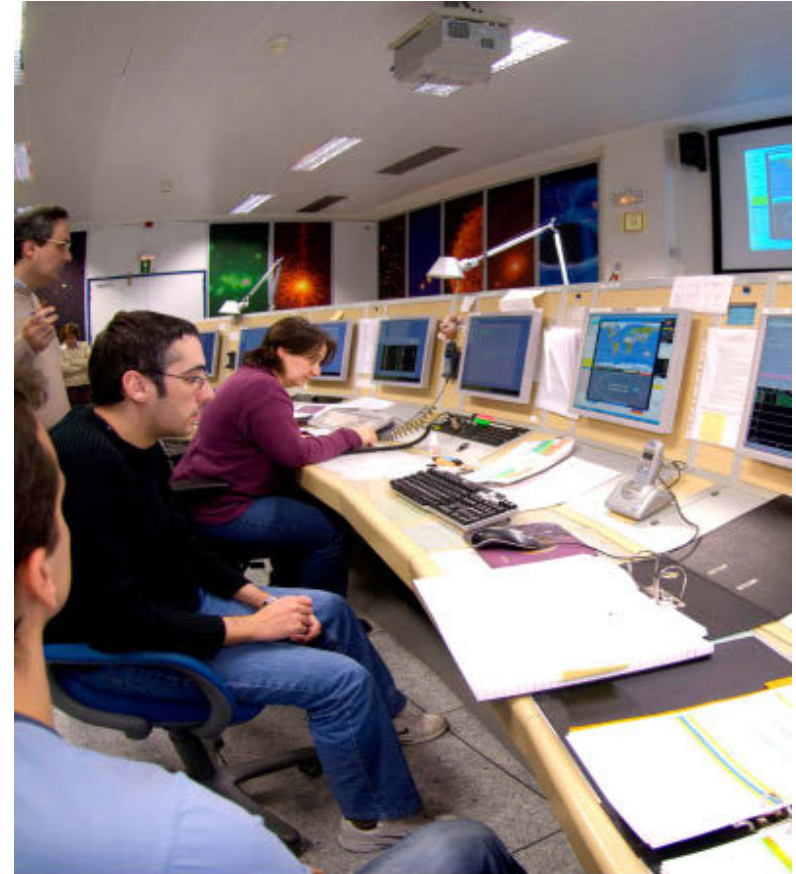


2015 LISA Pathfinder (Demonstrating gravitational wave techno)



D/SCI Operations Department

- Science Operations Centres (SOCs) for
 - Astronomy,
 - Heliospheric, and
 - Planetary missions.
- Science Data Archives
 - long-term access to data & information.
- Overall management of ESA's operational space science missions.
- Involved in ~25 missions/studies.
- Nearly 250 scientists and engineers involved at ESAC and at STScI, GSFC, ESTEC, ...



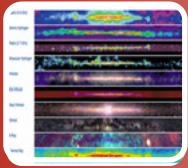
Science Operations Centres

Provide, usually with member state/international partners, some/all of following elements:

- Interfaces to users,
- Payload operations,
- Payload data acquisition and processing,
- Science data archiving and distribution,
- Plus associated software (and procedures).



Science Data Archives



Enable maximum **scientific exploitation** of data sets



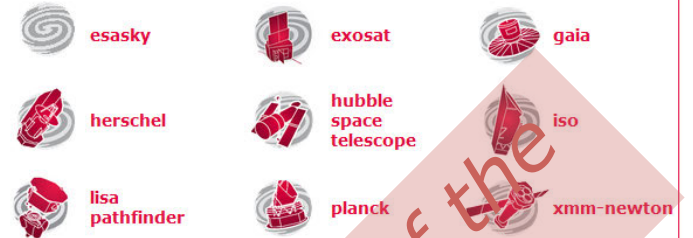
Enable efficient **long-term preservation** of data, software and knowledge, using modern technology



Enable cost-effective archive production by **integration in, and across, projects**

ESAC SCIENCE DATA CENTRE

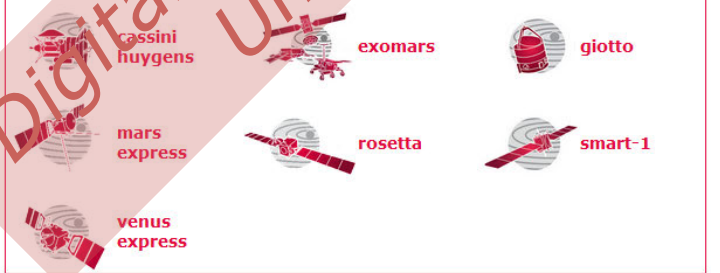
Astronomy Science Archives



Heliophysics Science Archives



The Planetary Science Archive



Future Archives



Digital Library of the Universe

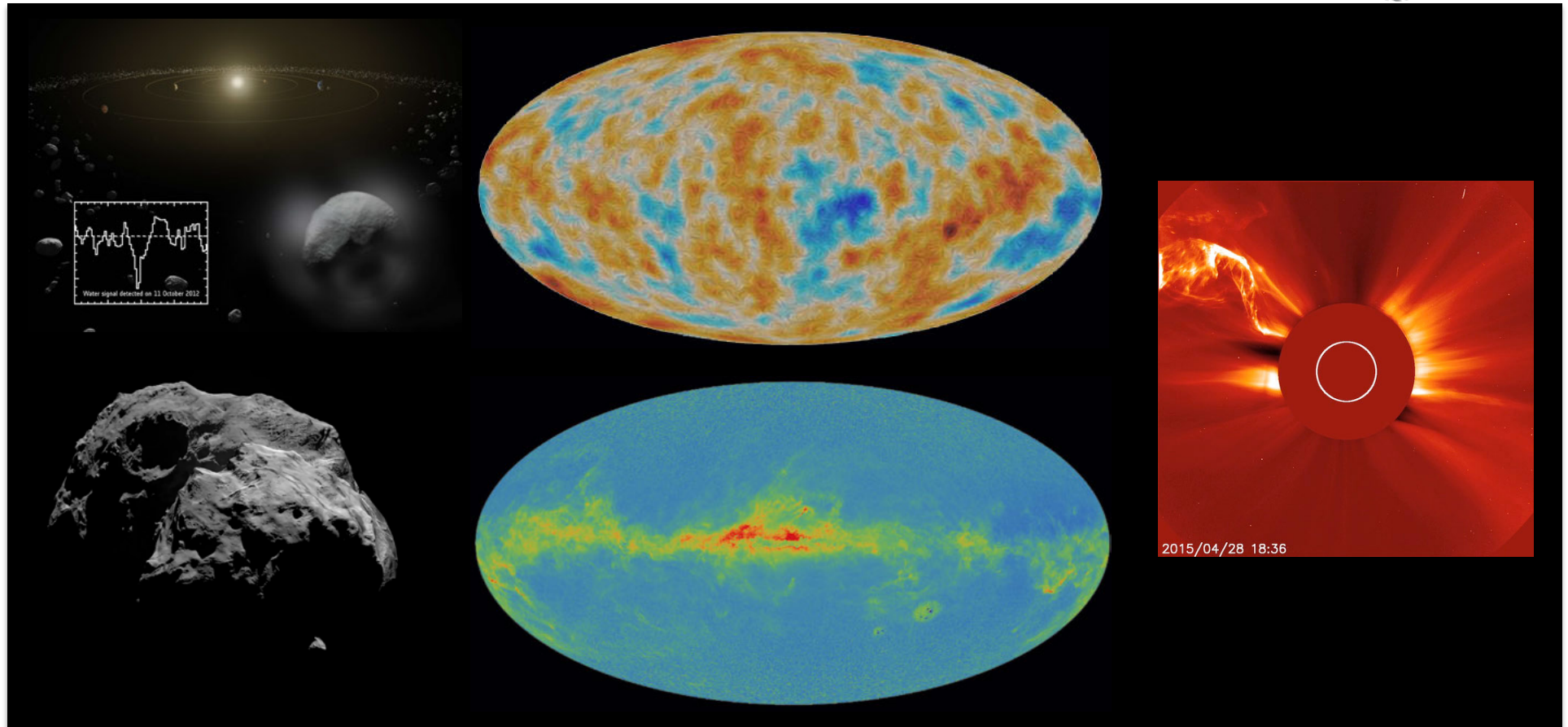


Innovation: all the skies in your browser
ESASky - sky.esa.int

ESASky sits "on top of" all ESA astronomy archives

- Facilitate data discovery and archival science for all users
- Improved User experience, project/jargon agnostic
- Towards multi-wavelength science data exploitation
- See the sky through different "eyes"

Why we do (science) operations!



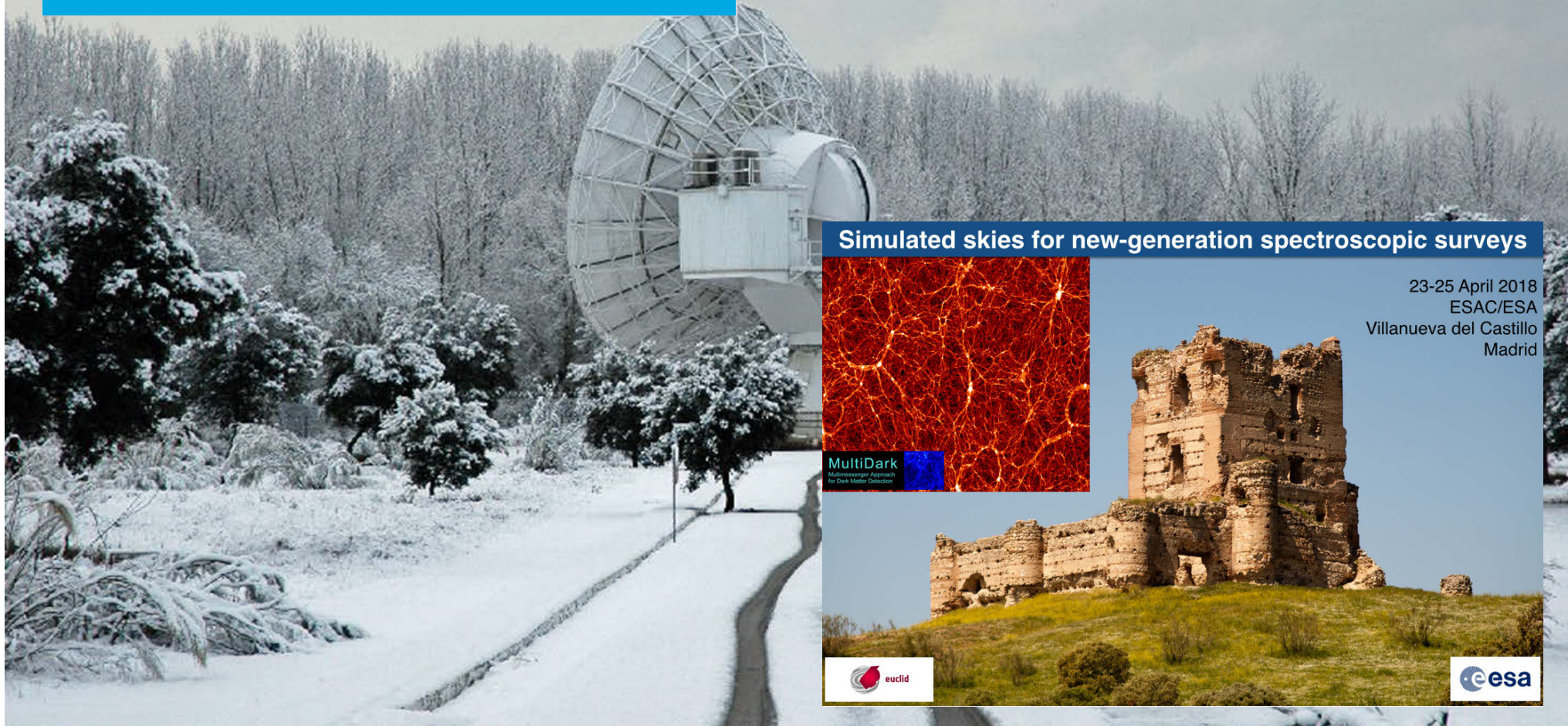
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European Space Agency

Best wishes for the workshop!
Thank you!



Simulated skies for new-generation spectroscopic surveys

23-25 April 2018
ESAC/ESA
Villanueva del Castillo
Madrid

