

## КОСМІЧНІ МІСІЇ ЄВРОПЕЙСЬКОГО КОСМІЧНОГО АГЕНТСТВА

Європейське космічне агентство (ЄКА) засноване в 1975 р. Нині воно залучає ресурси 20 держав Європи для виконання наукових програм космічних досліджень, спостережень Землі, навігації, телекомунікації і астрономії з допомогою автоматичних і пілотованих космічних місій. В наведених нижче таблицях подано інформацію про автоматичні космічні місії ЄКА, а також про участь європейських країн у виконанні пілотованих космічних програм.

### 1. SPACE SCIENCE AND ROBOTIC EXPLORATION

Name	Launch	Mission
<b>SUN</b>		
ESRO-2	1968	Cosmic and X-radiation from the Sun
ISEE-B	1977	International Sun-Earth Explorer
Ulysses	1990	First spacecraft to overfly the Sun's poles
SOHO	1995	Studying the Sun's core, outer corona and solar wind
Cluster & Double Star (with China)	2000 2003/4	Interaction of the solar wind and Earth's magnetosphere
Solar Orbiter	2017	Study of the Sun from close range
<b>SOLAR SYSTEM AND SUN-EARTH INTERACTIONS</b>		
Aurora	1968	Polar frontiers of the Van Allen radiation belt
HEOS-1	1968	Interplanetary magnetic fields
Boreas	1969	Polar frontiers of the Van Allen radiation belt
HEOS-2	1972	Interplanetary magnetic field
ESRO-4	1972	Upper atmosphere temperature variations
GEOS-1	1977	Plasma particles and waves in Earth's magnetic field
GEOS-2	1978	Movement in Earth's upper atmosphere
Giotto	1985	Fly-past of Comet Halley and Comet Grigg-Skjellerup
Cassini-Huygens	1997	Exploring Saturn's system and descending onto its largest moon Titan
Mars Express	2003	Studying the atmosphere, surface and subsurface of the Red Planet
SMART-1	2003	Testing solar-electric propulsion and studying the Moon's surface
Huygens	2004	Probing the atmosphere and surface of Titan
Rosetta	2004	Orbiter of Comet 67P/Churyumov-Gerasimenko and Philae lander
Venus Express	2005	Exploring Venus and its atmosphere
BepiColombo	2014	Exploring the planet Mercury
<b>ASTRONOMY AND THE EXOTIC UNIVERSE</b>		
TD-1A	1972	Measuring ultraviolet radiation from 15000 stars
Cos-B	1975	Gamma-ray studies
IUE	1978	Ultraviolet observations of 10 000 celestial objects
Exosat	1983	X-ray emissions of astronomical phenomena
Hipparcos	1989	Position measurements of 120 000 stars
Hubble Space Telescope	1990	Orbiting astronomical observatory
ISO	1995	Exploring the infrared Universe
XMM-Newton	1999	The most sensitive X-ray observatory to date
Integral	2002	Observing the most energetic phenomena in gamma rays
Herschel	2009	Infrared emissions from stars and galaxies
Planck	2009	Studying the Cosmic Microwave Background radiation
LISA Pathfinder	2013	Technology test for LISA mission
Gaia	2013	Precision mapping of one billion stars
JWST	2018	Second-generation space telescope

## 2. EARTH OBSERVATION MISSIONS

Name	Launch	Mission
Meteosat-1	1977	Pre-operational meteorological services
Meteosat-2	1981	Pre-operational meteorological services
Meteosat-3	1988	Pre-operational meteorological services
Meteosat-4	1989	Operational meteorology
Wleteosat-5	1991	Operational meteorology
ERS-1	1991	Pre-operational Earth observation radar
Meteosat-6	1993	Operational meteorology
ERS-2	1995	Pre-operational Earth observation radar
Meteosat-7	1997	Operational meteorology
Proba-1	2001	Technology/Earth observation
Envisat	2002	Earth observation
Meteosat-8	2002	Formerly MSG-1, operational meteorology
MSG-2	2005	Operational meteorology
MetOp-A	2006	Meteorological services
GOCE	2009	Gravity field and geoid
SMOS	2009	Soil moisture and ocean salinity
CryoSat-2	2010	Ice sheets and marine ice cover
Swarm	2012	Magnetic field studies
Sentinel-1	2012	Operational radar imaging
MSG-3	2012	Operational meteorology
MetOp-B	2012	Polar meteorology
Aeolus	2013	Atmospheric dynamics
Sentinel-2	2013	Land monitoring
Sentinel-3	2013	Marine monitoring
MSG-4	2014	Operational meteorology
EarthCARE	2015	Radiation and cloud interactions
MetOp-C	2016	Polar meteorological services
MTG-1	2017	Meteosat Third Generation
Sentinel-4	2017	Payload for atmospheric monitoring
Sentinel-5	2020	Payload for atmospheric monitoring

## 3. GALILEO NAVIGATION

Name	Launch	Mission
GIOVE-A	2005	Demonstration mission
GIOVE-B	2008	Demonstration mission
IOVx2	2011	In-orbit Validation to Qualify Galileo design
IOVx2	2012	In-orbit Validation to Qualify Galileo design

## 4. TELECOMMUNICATIONS MISSIONS

Name	Launch	Mission
OTS-2	1978	Telecoms technology demonstration
Marecs-A	1981	Maritime communications
ECS-1	1983	Operational communications satellite
ECS-2	1984	Operational communications satellite
Marecs-B2	1984	Maritime communications
ECS-4	1987	Operational communications satellite
ECS-5	1988	Operational communications satellite
Olympus	1989	Telecoms technology demonstration
Artemis	2001	Telecoms technology demonstration
Hylas-1	2010	Broadband services in public-private partnership
SmailCEO	2012	Geostationary telecoms
Alphasat	2013	Next-generation telecoms satellite
EDRS-A	2013	Data relay satellite
EDRS-C	2015	Data relay satellite

## 5. EUROPEAN ASTRONAUTS IN SPACE

Name	Country	Mission	Year
Vladimir Remek	Czechoslovakia	Soyuz-28	1978
Mirosław Hermaszewski	Poland	Soyuz-30	1978
Siegfried Jähn	Germany	Soyuz-31	1978
Georgi Ivanov	Bulgaria	Soyuz-33	1979
Bertalan Farkas	Hungary	Soyuz-36	1980
Dimitru Prunariu	Romania	Soyuz-40	1981
Jean-Loup Chretien	France	Soyuz T-6	1982
		Soyuz TM-7	1988
		STS-86	1997
Ulf Merbold	Germany	STS-9	1983
		STS-42	1992
		Euromir 94/Soyuz TM-20	1994
Patrick Baudry	France	STS-51G	1985
Reinhard Furrer	Germany	STS-61A	1985
Ernst Messerschmid	Germany	STS-61A	1985

Wubbo Ockels	Netherlands	STS-61A	1985
Alexander Alexandrov	Bulgaria	Soyuz TM-5	1988
Helen Sharman	United Kingdom	Soyuz TM-12	1991
Franz Viehbök	Austria	Soyuz TM-13	1991
Klaus-Dietrich Flade	Germany	Soyuz TM-14	1992
Dirk Frimout	Belgium	STS-45	1992
Michel Tognini	France	Antares/Soyuz TM-15	1992
		STS-93	1999
Franco Malerba	Italy	STS-46	1992
Claude Nicollier	Switzerland	STS-46	1992
		STS-61	1993
		STS-75	1996
		STS-103	1999
Hans Schlegel	Germany	STS-55	1993
		STS-122	2008
Ulrich Walter	Germany	STS-55	1993
Jean-Pierre Haignere	France	Altair/Soyuz TM-17	1993
		Perseus/Soyuz TM-29	1999
Jean-Francois Clervoy	France	STS-66	1994
		STS-84	1997
		STS-103	1999
Thomas Reiter	Germany	Euromir 95/Soyuz TM-22	1995/6
		Astrolab/STS-121	2006
Maurizio Cheli	Italy	STS-75	1996
Umberto Guidoni	Italy	STS-75	1996
		STS-100	2001
Jean-Jaques Favier	France	STS-78	1996
Claudie Haignere	France	Cassiopee/Soyuz TM-24	1996
		Andromede/Soyuz TM-33	2001
Reinhold Ewald	Germany	Soyuz TM-25	1997
Leopold Eyharts	France	Pegase/Soyuz TM-27	1998
		STS-122	2008
Pedro Duque	Spain	STS-95	1998
		Cervantes/Soyuz TMA-3	2003
Ivan Bella	Slovakia	Soyuz TM-29	1999
Gerhard Thiele	Germany	STS-99	2000
Roberto Vittori	Italy	Marco Polo/Soyuz TM-34	2002
		Eneide/Soyuz TMA-6	2005
		DAMA/STS-134	2011
Philippe Perrin	France	STS-111	2002
Frank De Winne	Belgium	Odissea/ Soyuz TMA-1	2002
		OasISS/Soyuz TMA-15	2009
Andre Kuipers	Netherlands	Delta/Soyuz TMA-4	2004
Christer Fuglesang	Sweden	Celsius/STS-116	2006
		Alisse/STS-128	2009
Paolo Nespoli	Italy	STS-120	2007
		MagISStra/Soyuz TMA-20	2010