ESA Highlights 2016

2016 has been an incredible year for the European Space Agency, ESA. With astronauts visiting the ISS, Galileo deployment going at full speed and initial services declared. Or pioneering missions such as ExoMars. ESA is once again proving it is at the forefront of cutting edge technology and that its missions are an enrichment for the whole of humanity.

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| 10:00:00 | ESA leader |
| 10:00:10 | Title: ESA Highlights 2016 |
| * Animation of Spinning globe + Copernicus satellites – 23/05/2015- ESA
* INT: Sentinel 3 cleanroom Thales-Alenia – Cannes, France – sept 2015 – ESA
* Animation sentinel-3 fly by –ESA
* Animations sentinel-1, deployment, overview, scanning –ESA
 | For the European space agency, ESA, 2016 will surely be remembered for the progress made within its Earth Observation programme, Copernicus, managed in collaboration with the European Commission. ESA launched two more Sentinel satellites for Copernicus: Sentinel-3A, launched in February, which will provide highly accurate measurements of the Earth’s oceans, land, ice and atmosphere. In April Sentinel-1B was launched joining on orbit its twin brother Sentinel-1A. The sentinel-1 radar mission will supply an all-weather, day and night imagery of the Earth’s surface. This Satellite data is crucial to monitoring our planet and understanding climate change.  |
| 10:00:53:16* INT: images of Galileo facilities Kourou, Preparations of the satellites – KOUROU FRENCH-GUIANA – sept/oct 2016 – ESA
* EXT. Galileosat 9-10 Launch – Kourou French-Guiana – 11/09/2016 – ESA
* EXT. Galileosat 15-16-17-18 Ariane 5 Launch – Kourou French-Guiana – 17/11/2016 – ESA
* INT. Galileo control center: Control room - Oberpfaffenhofen, Germany – 18/12/13 – ESA
* Animation Galileo sat in space – 2016 - ESA
 | ESA also made progress in another joint programme with the European Commission, Galileo. With the launch of 6 more satellites from Kourou, the constellation is now composed of 18 satellites. Two were launched in May with a Soyuz rocket. The other four were launched on top of Ariane 5 last November. Ariane 5, which completed its 75th successful launch in a row, had been specially modified with a structure capable of accommodating four satellites. On 15 December the European Commission declared Galileo operational for initial services - a major step for Europe's own satellite navigation system.  |
| 10:01:37:00* INT. EDRS in cleanroom –Airbus, Toulouse – 2014 – ESA
* Animation of EDRS –ESA
 | In the telecommunication area, in January ESA launched the EDRS-A node aboard a EUTELSAT satellite. EDRS or European Data Relay System is a laser communication network. Its purpose is to significantly speed up the flow of information between low orbit satellites and the ground, thus initiating a Space Data Highway.  |
| 10:02:05:06 * EXT. Launch of LISA Pathfinder with VEGA launcher – Kourou French Guiana – Jan. 2015 - ESA
* Animation LISA Pathfinder in space, results and Gravitational waves, Pathfinder in space – 2015 – ESA

10:02:22:23* Animations Gaia mapping the stars –ESA

10:02:42:21* Animation Rosetta +Philae – ESA
* Images of Philae on comet by Rosetta – sep 2016 – ESA
* Animation Rosetta in solar system–ESA
* Int. ESOC Rosetta control center – Germany – October 2016-ESA
* Rosetta images of Comet P67 –– ESA

10:03:35:20* EXT. EXOMARS launch – Baikonur, Kazachstan – 14/03/2016 – ESA
* Animations Exomars Trace Gas Orbiter, Schiaparelli lander
* Images of Schiaparelli crash site by orbiter – nov 2016 –ESA
* Animations mars rover – 2015 - ESA
* Animations Exomars Trace Gas Orbiter
 | 2016 was important for ESA’s Science missions. Launched in December 2015, LISA Pathfinder, a technology demonstration mission for gravitational wave detection, proved it was capable of measuring this new domain - thus opening a new field of research for astronomy and confirming Einstein’s theory of relativity. Meanwhile, the GAIA mission concluded 2 years of its five year survey of celestial objects. The mission is on track to complete the most detailed mapping of the Milky Way. In September the first catalogue of over a billion stars was released - a great tool for astronomers.Rosetta, the iconic comet chaser mission, came to an end in 2016. After the breath-taking landing of Philae on comet Churyumov–Gerasimenko in November 2014, it was believed that the little lander was lost. However, in September Rosetta caught sight of Philae, stuck in the shade of a cliff. After this final goodbye, the orbiter was sent for a soft landing on the comet, marking the end of these unique operations to observe a full cycle of a comet orbiting the sun.At ESOC in Germany, the loss of signal told mission control that Rosetta’s adventure was over. However, for the scientific community the adventure continues: the data gathered by Rosetta will be studied for decades to come, advancing cometary science and our understanding of the universe.2016 was also the Martian year for ESA with the launch of ExoMars from Baikonur in April and its arrival at the red planet in October. After successfully placing the Trace Gas Orbiter into Mars orbit on the 19th October, it has sent back its first images, showing all the promises of this big lab to study Mars.In parallel, the lander demonstrator Schiaparelli collected almost all of its scheduled data before its unexpected crash landing on the Martian surface. Crucial lessons will be learnt from this for the upcoming ExoMars 2020 mission, which will put Europe’s first rover on Mars to search for life. The precise cause of the lander loss is still being investigated and as always in space, many lessons will be learnt from this anomaly.  |
| 10:04:32:06* Ext. Luzern ministerial- Switzerland – dec 2016- ESA
* INT. Luzern ministerial – Switzerland – dec 2016

10:04:43:22* EXT. Earth view from ISS – ESA
 | The data gathered by the Orbiter will certainly be important in the future as, at the two-day council meeting at ministerial level in Lucerne last December, the green light was given to the continuation of the EXOMARS programme despite the Schiaparelli mishap. The ministers in charge of space also confirmed in Switzerland the importance of exploration and agreed to continue supporting the International Space Station until 2024. |
| 10:04:49:23* EXT ISS spacewalks - unknown date – ESA
* INT ISS Tim Peake and Thomas Pesquet – 2016 – ESA.
 | In 2016 2 ESA astronauts stayed aboard the ISS: In June British ESA astronaut Tim Peake returned to Earth after a 186-day stay. In mid- November Thomas Pesquet from France started the 9th ESA long duration mission. |
| 10:05:15:19* Animation VEGA-C launch – 2016 ESA
* Animation Ariane 6 launch – 2016 –ESA
* EXT. Arial vieuws of new Ariane 6 launchpad with other launchpads in background – Arianespace, Kourou, French-Guiana – 2016 - ESA
 | Ministers also agreed to continue securing Europe’s independent access to space, supporting new elements of ESA’s launcher programme. In fact, before Lucerne the full development of Ariane 6 and Vega C had already been confirmed. Ariane 6’s first flight is planned for 2020 and at Europe’s Spaceport in Kourou preparations have already started with the work on a new launch pad. For ESA, the building of the future is taking shape in the Guianese rain forest.   |
|  | B-ROLL |
| 10:05:49:21 | **Ariane 6 launch site construction****Arianespace****Kourou, French-Guiana****2016****ESA** |
| 10:08:30:12 | **Ariane 6 launch****Animation****2016****ESA** |
| 10:09:57:07 | **Vega C launch****Animation****2016****ESA** |
| 10:11:34:05 | **EXOMARS + ROVER****Animation****2016****ESA** |
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