**Aeolus: Of weather and winds**

**Aeolus, the European Space agency’s newest earth explorer satellite will soon be launched from Kourou. This satellite is a technology demonstration whereby ESA will measure wind profiles from space with laser technology. This has never been done before. But why are these wind profiles from space so important? How do winds work and how do they impact live on our planet?**

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| 10:00:00 | ESA leader |
| 10:00:10 | Title: **AEOLUS: OF WEATHER AND WINDS** |
| 10:00:10  EXT. Wind through trees - 2016 Overpelt Belgium - ESA  ANIMATION. Global wind patterns - 2018 - ESA | Winds on our planet are created by the difference in temperature between the equatorial regions and the poles. They are the flow of air from high to low pressure. As warm air rises in the tropics, it flows towards the poles were the air pressure is lower. On its way there the air cools and sinks again, conversely leading to higher pressure and counterflows near the surface. This way winds are basically redistributing heat energy over our planet. This process of energy redistribution combined with the earth’s rotation generates the weather patterns we experience every day and makes our planet habitable. |
| 10:00:51  INT. Interview Lars Isaksen, European Centre for Medium-Range Forecast, Reading UK - July 2018 - ESA | **Itw Lars Isaksen**  **principal scientist – European Centre for Medium-Range Weather Forecasts ECMWF**  *If we didn’t have any winds in the atmosphere then it would be very hot in the tropical regions and very cold in the northern regions we would not be able to live in Europe. Winds is a very effective transport mechanism of energy. It is similar to a draft in your house. When you open a window you get flow in and change the temperature in the house. The wind have the same effect for the circulation so that is the main reason for the wind* |
| 10:01:22  EXT. Ancient ruins - videoblocks  Still. Lascaux image - unknown source  EXT. Clouds - videoblocks  EXT. Ancient ruins - videoblocks  Still. Ancient Greek vase with oracle unknown source  ANIMATION. Windmap of the USA - ECMWF  EXT. European Centre for Medium-Range Weather forecast, Reading UK - July 2018 - ESA  ANIMATION. Medium forecast maps of Europe - august 2018 - ECMWF  ANIMATION. Medium-range forecast maps of Europe - august 2018 - ECMWF  Still. monthly forecast - august 2018 - ECMWF  ANIMATION. Seasonal forecast map of Europe - august 2018 - ECMWF  ANIMATION. temperature forecast map of Europe - august 2018 - ECMWF  INT. Weatherman in studio - Videoblock  INT. Weathergirl in studio - Videoblock | Since the dawn of time mankind has been trying to assess winds and predict the weather. Where in these ancient times farmers had to consult soothsayers and oracles, today we have more modern ways of predicting the weather. This is the European Centre for Medium Range Weather Forecasts in Reading, UK, a partner of ESA in the Aeolus programme. They make global numerical weather predictions based on in-situ and satellite measurements. Their forecasts include detailed weather predictions within the next two weeks, less detailed forecasts for the next month and indications of likely trends up to a year ahead. These numerical predictions are the basis for weather reports worldwide and they are important for society. |
| 10:02:09  INT. Interview Michael Rennie, European Centre for Medium-Range Forecast, Reading UK - July 2018 - ESA | **ITW Michael RENNIE, Scientist – European Centre for Medium-Range Weather Forecasts ECMWF**  *The reason why it is important for society is, Probably the most important reason is that it can save lives. Because occasionally the weather is extreme. Figure extreme storms and it is very important that we warn people of this in advance and the more accurate we can make this forecast the earlier we can advise people to take action to avoid be involved in weather disasters.* |
| 10:02:38  INT. ECMWF server room, Reading UK - June 2018 - ECMWF  Still. Wind speed chart - August 2018 - ECMWF  Still. temperature map of Europe - August 2018 - ECMWF  Still. Wind speed chart - August 2018 - ECMWF  Ext. Instruments KNMI –Utrecht, The Netherlands – Feb 2018  EXT. Release of Weather Balloon - HohenPeissenberg observatory, Germany – Feb 2018 – ESA  Ext. Instruments KNMI –Utrecht, The Netherlands – Feb 2018  ANIMATION. Senitnel-3 in orbit - ESA  ANIMATION. MSG-3 in orbit - EUMETSAT  EXT. Clouds - videoblocks  EXT. rolling waves- videoblocks  ANIMATION. Windstorm Zeus - ECMWF  EXT. fly over desert - videoblocks  EXT. fly over Ocean - videoblocks  ANIMATION. Aeolus meausring winds profiles - 2017 - ESA | In order to run weather models based on numerical weather prediction it is important to have sufficient and accurate data on the current state of the atmosphere, such as global wind and temperature, as it is their interaction which drives our weather. Today this data is mainly obtained via in-situ measurements of weather balloons, ground stations and data from airplanes. Satellites are used to measure temperatures from space and track winds indirectly through cloud movement and wave movement on the ocean surface. However there remains a significant gap in wind data over vast land areas, the oceans and especially between the altitudes of 10 to 30 kilometers where there is no in-situ data available. |
| 10:03:27  INT. Interview Michael Rennie, European Centre for Medium-Range Forecast, Reading UK - July 2018 - ESA | **ITW Michael Rennie, Scientist – European Centre for Medium-Range Weather Forecasts ECMWF**  *So we need to know the winds in remote areas such as over the oceans because those winds in those areas determine what the weather will be downstream in for example well populated areas such as Europe many days later.* |
| 10:03:42  INT. Aeolus in cleanroom – Airbus Interspace, Toulouse, France - March 2017 – ESA  EXT. ECMWF sign, Reading UK - June 2018 - ECMWF  Animation. Aeolus in orbit – 2017 – ESA  Animation. Aeolus in orbit – 2017 – Airbus Defense & space | To address this need for more accurate global wind profiles ESA will soon launch the Aeolus earth explorer satellite with the ECMWF processing the data. If Aeolus can deliver the long awaited wind data meteorologists hope more satellites like Aeolus will be launched in the future. For numerical weather forecasts it is important to have accurate wind measurements today to predict the weather tomorrow. |
| **10:04:11** | **B-ROLL** |
| INT. Interview Lars Isaksen, European Centre for Medium-Range Forecast, Reading UK - July 2018 - ESA | **ITW LARS ISAKSEN – Principal Scientist European Centre for Medium-Range Weather Forecasts - English**   * how winds are created * Why winds are important for weather forecasts * What does the ECMWF do * how better winds data can improve forecasts |
| 10:06:57  INT. Interview Lars Isaksen, European Centre for Medium-Range Forecast, Reading UK - July 2018 - ESA | **ITW LARS ISAKSEN – Principal Scientist European Centre for Medium-Range Weather Forecasts - Danish**   * What are winds * how winds influence the weather * how satellite can help us understand weather |
| 10:09:18  INT. Interview Michael Rennie, European Centre for Medium-Range Forecast, Reading UK - July 2018 - ESA | **ITW Michael Rennie, Scientist – European Centre for Medium-Range Weather Forecasts - English**   * importance of winds for weather forecasts * Role of the ECMWF in the Aeolus programme * ECMWF produce the level 2B products for Aeolus * Hope for a follow-up mission for Aeolus * Multiple Aeolus satellites |
| 10:11:33  EXT/INT. European Centre for Medium-Range Forecast, Reading UK - July 2018 - ESA | **GV**  **European Centre for Medium-Range**  **Weather Forecast**  **ESA - 13 shots** |
| 10:12:33  ANIMATION. Global wind patterns - 2018 - ESA | **Global wind**  **Animation**  **ESA** |
| 10:13:38  ANIMATION. Windstorm Doris and Zeus - ECMWF | **Zeus Animation ECMWF** |
| 10:13:59  **10:14:09** | BROLL END  **GEN END** |