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Satellite Projects in ESA ARTES Programme

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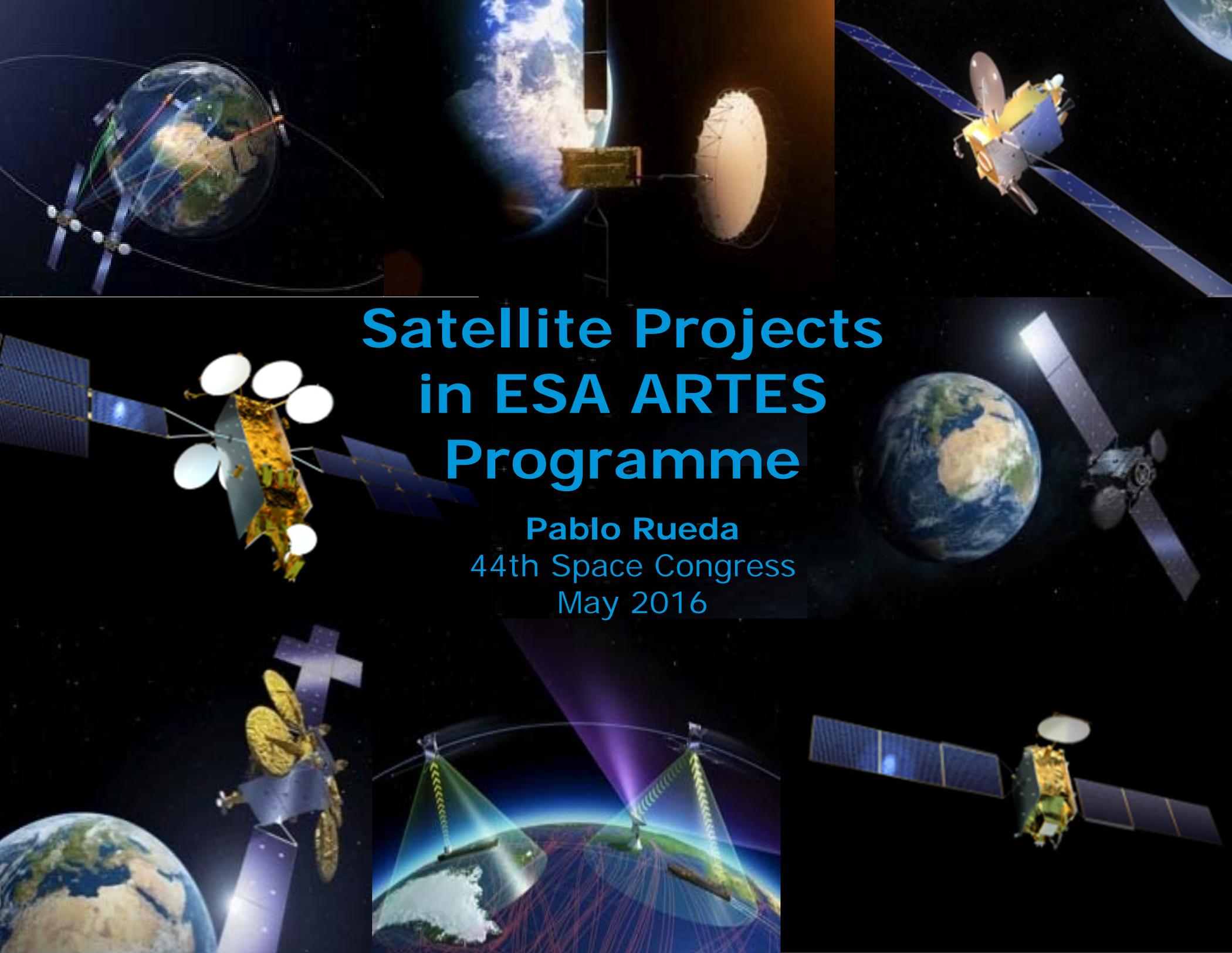
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Satellite Projects in ESA ARTES Programme

Pablo Rueda
44th Space Congress
May 2016

ARTES: Technology Development through co-funded Projects



- **ARTES Programme** supports technology development with strong investment from Industrial side, at all levels

OPERATORS

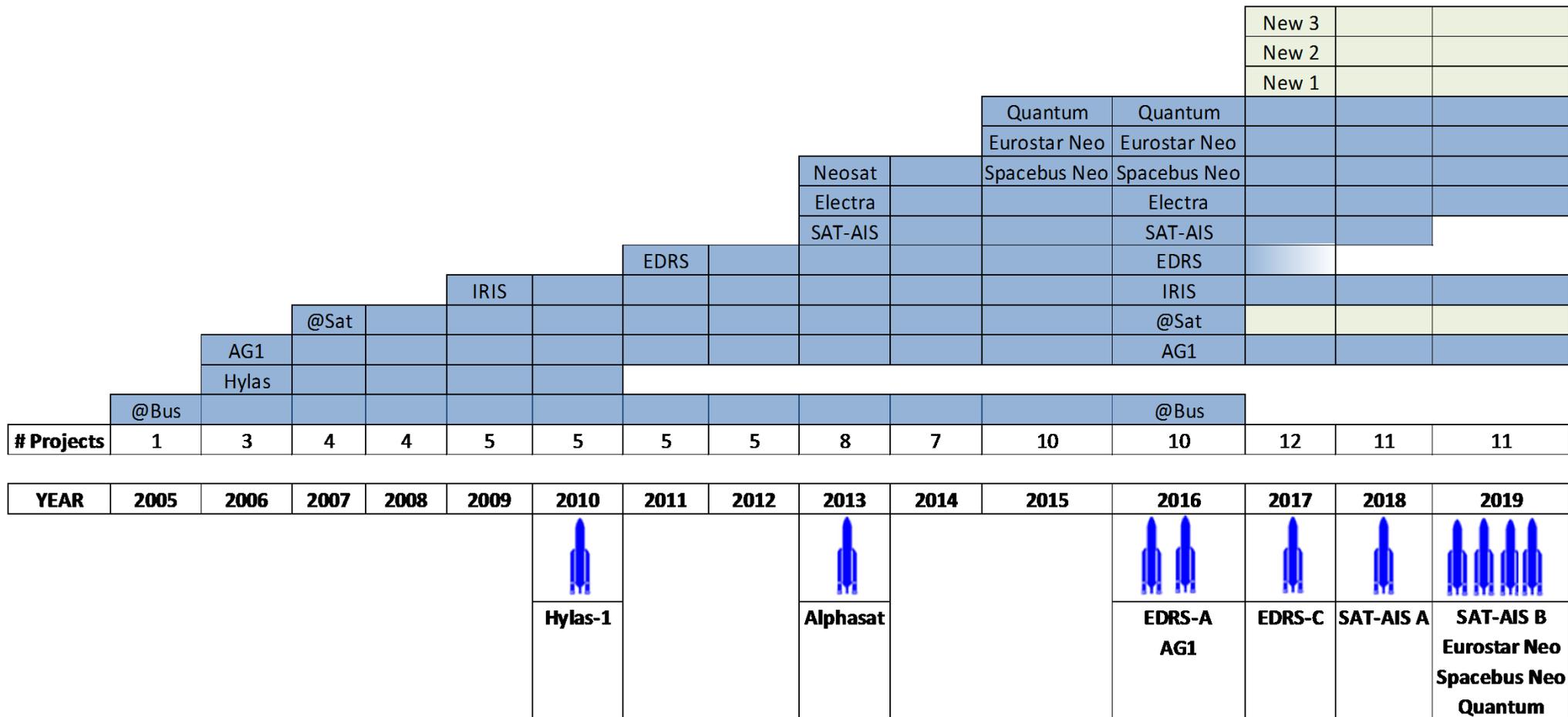


SATELLITE PRIMES



...AND EQUIPMENT SUPPLIERS

ARTES Portfolio of Satellite Projects



Telecommunications Satellite Programmes

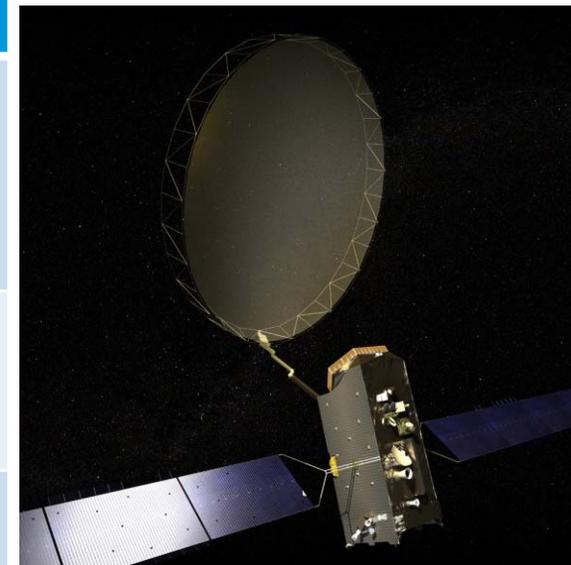


- Alphasat - Alphasat
- Small GEO/AG1
- EDRS
- Eurostar Neo
- Spacebus Neo
- SAT AIS 2B
- Electra
- Quantum

Alhabus/alphasat



Technical Description		Status
Industrial Organization:	<ul style="list-style-type: none"> • ESA/CNES cooperation • Alhabus Co-primers: TAS and ADS • Alphasat Prime: Airbus Tlse • Operator: Inmarsat 	
Alhabus (ARTES 8 sub-element I)	<ul style="list-style-type: none"> • Large platform for telecommunications satellites in geo-stationary orbit 	<ul style="list-style-type: none"> • Full qualification completed and PFM platform delivered
Alphasat (ARTES 8 sub-element II) 	<ul style="list-style-type: none"> • Prime: Airbus Tlse • Operator: Inmarsat • First flight model of the Alhabus platform • It includes an innovative L-Band payload and flies 160 kg of ESA Technology Demonstration Payloads (TDPs) 	<ul style="list-style-type: none"> • Satellite launched in July 2013 by Ariane 5 • Start of nominal 3 year TDP operations January 2014 • Transfer of Inmarsat traffic to Alphasat March 2015 • TDP operations extended till end 2019
Alhabus Extension (ARTES 8 sub-element III)	<ul style="list-style-type: none"> • Extends the Alhabus range to address the very high-power end of communication satellite market (22KW payload) 	<ul style="list-style-type: none"> • Qualification review held in March 2015
Alphasat Ground and User Segment and Applications (ARTES 8 sub-element IV)	<ul style="list-style-type: none"> • Development and qualification of the Alphasat Ground and User Segment and Applications 	<ul style="list-style-type: none"> • Activity completed end 2014



Technical Description		Status
Industrial Organization:	<ul style="list-style-type: none"> • Prime: OHB • Operator: Hispasat 	
ARTES 11.1 Hybrid SGEO Platform development	<ul style="list-style-type: none"> • Development of a small geo platform • Payload capacity: 400 kg, 3.6 kW EOL 	<ul style="list-style-type: none"> • Satellite environment test campaign on-going
ARTES 11.2 Hispasat AG1 mission	<ul style="list-style-type: none"> • First SATCOM based on Small GEO platform • Ku and Ka band, innovative payload with regenerative OBP and DRA 	
ARTES 11.3: Small GEO Extension	<ul style="list-style-type: none"> • Further improve the Small GEO product: versatility, mass, cost, industrialisation... 	

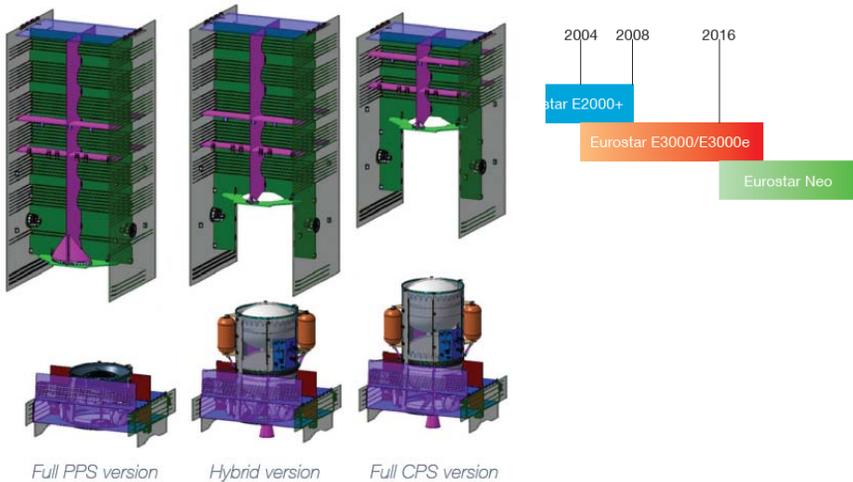
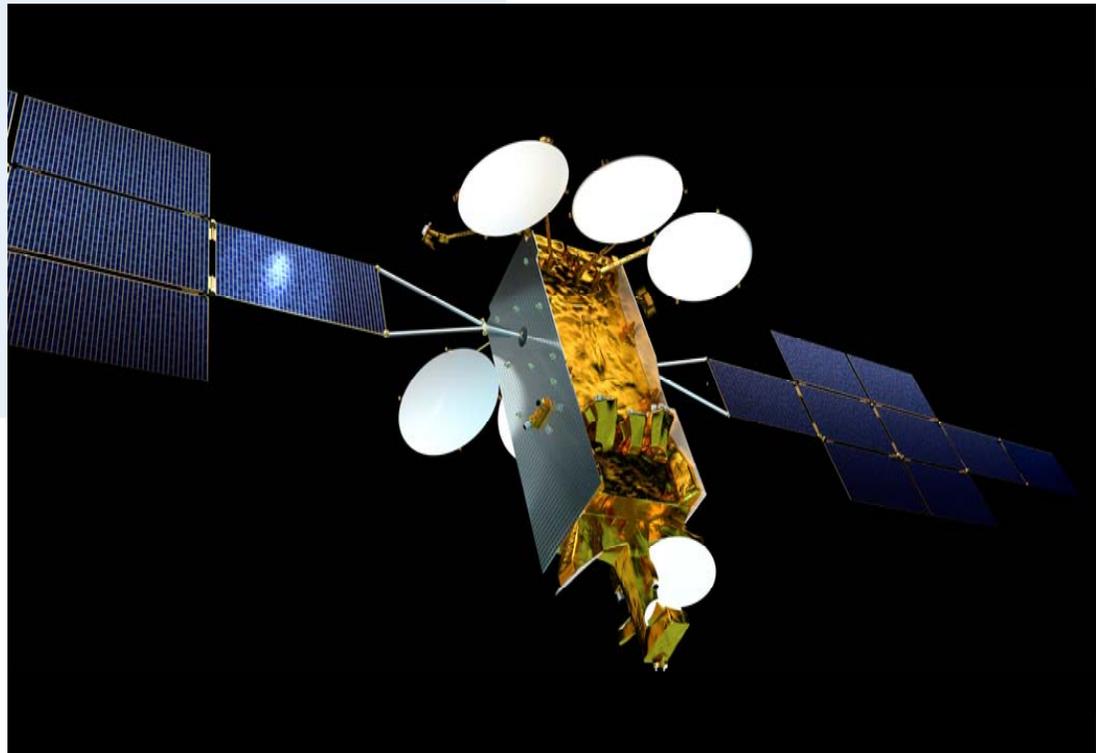


Technical Description		Status
Industrial Organization:	<ul style="list-style-type: none"> • Prime: Airbus D&S • Operator: Airbus D&S 	
Space Segment EDRS-A	<ul style="list-style-type: none"> • Hosted Payload on Eutelsat EB9B • Launch Q1/2016 • GEO, orbital location 9° East 	EDRS-A: Satellite launched on Jan.29 th , 2016 Links with laser terminal successfully established
EDRS-C	<ul style="list-style-type: none"> • Dedicated Satellite, hosting Hylas 3 payload by Avanti • Launch Mid 2017 • GEO, orbital location 31° East 	EDRS-C: Satellite under integration and testing
Ground Segment	<ul style="list-style-type: none"> • MOC (DE) and Backup MOC (BE) • DPCC/SCC Oberpfaffenhofen (DE) • EDRS-A Ground Stations in Weilheim (DE) and Harwell (UK) • EDRS-C Feederlink Stations in Weilheim (DE) and Redu (BE) 	Ground Stations deployed 



Eurostar Neo

Technical Description		Status
Industrial Organization:	<ul style="list-style-type: none"> • ESA/CNES cooperation • Prime: Airbus DS Toulouse • Operator: To be selected 	
Eurostar Neo	<p>Program to:</p> <ul style="list-style-type: none"> • Develop a new platform product line • For a launch of a first mission before the end of the decade, progressively replacing Eurostar 3000 	<ul style="list-style-type: none"> • Phase C/D Contract signed in November 2015



Technical Description		Status
Industrial Organization:	<ul style="list-style-type: none"> • ESA/CNES cooperation • Prime: Thales Alenia Space • 1st Operator: Eutelsat 	
Spacebus Neo	<p>Program to:</p> <ul style="list-style-type: none"> • Develop a new platform product line • For a launch of a first mission before the end of the decade, progressively replacing TAS Spacebus Platform 	<ul style="list-style-type: none"> • Phase C/D contract signed on 15 September 2015 at World Satellite Business Week in Paris • TAS has signed on 28 October a contract with Eutelsat for a new-generation High Throughput Satellite to be launched in 2019 flying the first all-electric Spacebus Neo platform.

SAT-AIS

Technical Description 00		Status
Industrial Organization:	<ul style="list-style-type: none"> • Prime: LuxSpace • Operator: exactEarth 	
E-SAIL	<ul style="list-style-type: none"> • Developing a set of SAT-AIS Micro-Satellites (100kg / 100W class, 60x60x60cm size) with advanced signal processing in-orbit and high rate downlink for advanced ship message detection (“Automatic Identification System (AIS)”) • Satellites developed by LuxSpace as Prime Contractor to qualify the innovative technologies for the next generation of SAT-AIS micro-satellites • First launch planned in 2018 	<ul style="list-style-type: none"> • Satellite PDR completed
NAIS	<ul style="list-style-type: none"> • The Novel SAT-AIS Receiver (NAIS) is a payload on the Norwegian Space Centre’s NORSAT-1 satellite, developed by Kongsberg Seatex under ESA contract 	<ul style="list-style-type: none"> • QAR board declared the successful QAR closure 6th July 2015 • Flight Models received at NSC and integrated in satellite



Technical Description		Status
Industrial Organization:	<ul style="list-style-type: none">• Prime: OHB• Operator: SES	
Electra	<ul style="list-style-type: none">• Development of a competitive Full Electric platform derived from SGEO product• First in orbit validation of Electra platform with a dedicated SES payload• Payload freeze by launch – 36 months• Launch mid 2021• 3 years in orbit performance	<ul style="list-style-type: none">• Phase B1 successfully completed• Phase B2CDE1 Contract signed in February 2016



Technical Description

Status

Industrial Organization:

- **Prime:** Airbus DS
- **Operator:** Eutelsat

Quantum

The Quantum satellite is the first fully flexible, scalable and generic payload in Ku band using the first GEO-platform from SSTL

The Quantum payload is an extremely innovative flexible, scalable and generic payload operating in Ku band:

- Flexible orbital location
- Flexible Coverage
- Flexible BW capacity & Flexible Frequency plan
- Flexible Connectivity between coverages
- GEOLOC capability

- Contract signed on 9 July 2015
- PDR completed

