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• **11 FEBRUARY 2015: ESA EXPERIMENTAL SPACEPLANE COMPLETES RESEARCH FLIGHT**

• **AN IMPORTANT SUCCESS WHICH ALLOWS EUROPE TO TAKE UP NEW CHALLENGES IN SPACE TRANSPORTATION**

1 VEGA VV04 LIFTOFF WITH IXV SPACEPLANE (© ESA)

2 SCHEME OF IXV MISSION TIMELINE (© ESA)

3 IXV SPACEPLANE SAFELY RECOVERED (© ESA)

## WHAT IS THE CEAS ?

The Council of European Aerospace Societies (CEAS) is an International Non-Profit Association, with the aim to develop a framework within which the major Aerospace Societies in Europe can work together.

It presently comprises twelve Full Member Societies: 3AF (France), AIAE (Spain), AIDAA (Italy), DGLR (Germany), FTF (Sweden), HAES (Greece), NVvL (Netherlands), PSAA (Poland), AAAR (Romania), RAeS (United Kingdom), SVFW (Switzerland), TsAGI (Russia); one Associate Member: CzAeS (Czech republic); and four Corporate Members: ESA, EUROAVIA, LAETA (Portugal) and VKI (Belgium).

Following its establishment as a legal entity conferred under Belgium Law, this association began its operations on January 1<sup>st</sup>, 2007.

Its basic mission is to add value at a European level to the wide range of services provided by the constituent Member Societies, allowing for greater dialogue between the latter and the European institutions, governments, aerospace and defence industries and academia.

The CEAS is governed by a Board of Trustees, with representatives of each of the Member Societies.

Its Head Office is located in Belgium:

c/o DLR – Rue du Trône 98 – 1050 Brussels.

[www.ceas.org](http://www.ceas.org)

## WHAT DOES CEAS OFFER YOU ?

### KNOWLEDGE TRANSFER:

- A well-found structure for Technical Committees

### HIGH-LEVEL EUROPEAN CONFERENCES

- Technical pan-European events dealing with specific disciplines and the broader technical aspects
- The CEAS European Air and Space Conferences: every two years, a Technical oriented Conference, and alternating every two years also, a Public Policy & Strategy oriented Conference

### PUBLICATIONS:

- Position/Discussion papers on key issues
- CEAS Aeronautical Journal
- CEAS Space Journal
- CEAS Quarterly Bulletin
- Aerospace Events Calendar – [www.aerospace-events.eu](http://www.aerospace-events.eu)

### RELATIONSHIPS AT A EUROPEAN LEVEL:

- European Commission
- European Parliament
- ASD (AeroSpace and Defence Industries Association of Europe), EASA (European Aviation Safety Agency), EDA (European Defence Agency), ESA (European Space Agency), EUROCONTROL
- Other European organisations

### EUROPEAN PROFESSIONAL RECOGNITION:

- Directory of European Professionals

### HONOURS AND AWARDS:

- Annual CEAS Gold Medal to recognize outstanding achievement
- Medals in technical areas to recognize achievement

### YOUNG PROFESSIONAL AEROSPACE FORUM

### SPONSORING

## THE CEAS MANAGEMENT BOARD

### IT IS STRUCTURED AS FOLLOWS:

- General Functions: President, Director General, Finance, External Relations & Publications, Awards and Membership.
- Two Technical Branches:
  - Aeronautics Branch
  - Space Branch

Each of these two Branches, composed of specialized Technical Committees, is placed under the authority of a dedicated Chairman.

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## EDITORIAL

11 FEBRUARY: ESA OPENS 2015 WITH  
A WONDERFUL RE-ENTRY VEHICLE TEST

Jean-Pierre Sanfourche  
Editor-in-Chief,  
CEAS Quarterly Bulletin

The ESA's Intermediate eXperimental Vehicle (IXV) lifted off at 13:40 GMT on 11 February from Europe's Spaceport in Kourou, French Guiana, atop a Vega rocket.

It was the second qualification flight of Vega, which so demonstrated the reliability and flexibility of this new launcher.

After having separated from Vega at 340 km altitude, it continued its trajectory up to 412 km before descending. The re-entry at 120 km altitude with a speed of 7.5 km/s created the same conditions as those of a spacecraft returning from low Earth orbit. Then IXV glided through the atmosphere until deployment of the parachutes to slow the descent further allowing for a safe splashdown in the Pacific Ocean just west of Galapagos Islands, 100 minutes after lift-off. Balloons kept IXV afloat while the recovery vessel hurried to pick it up a couple of hours later. Once returned to Noordwijk (NL) at ESA/ESTEC, IXV is going to be dealt with detailed analyses.

"**This was a short mission with big impact**", said Giorgio Tumino, IXV project manager at ESA.

As a matter of fact, it is the first time Europe has launched and landed an unmanned space plane without wings but instead features on aerodynamic shape to fly through the atmosphere, with two flaps and four thrusters to autonomously steer it back to splashdown at a precise point. In addition to the knowledge acquired at system level, a many basic new scientific and technology advances will result from this flight, most notably:

- A more precise understanding of the hypersonic aerothermodynamics phenomena which induce changes in aerodynamic behaviour;
- An advanced guidance, navigation and control (GNC) system perfecting;
- Quite significant progresses in thermal protection and hot structures.

The cutting-edge technology validated plus the upcoming exploitation of the data gathered during flight from the 300 sensors (strain gauges, temperature and acceleration mea-

surements, IR cameras) aboard the IXV are going to open new opportunities for Europe to develop ambitious plans in space transportation: the results will feed the Programme for Reusable In-orbit Demonstrator for Europe – 'PRIDE' – the objective of which is to acquire the capability of autonomous re-entry with a view to developing a wide range of space transportation applications including space planes, reusable launcher stages, planetary probes and sample return, cargo and crew transport vehicles.

And in addition, it is obvious that these new advances will be reused outside the space area as well.

The IXV is the result of the industrial, technological and scientific expertise of a consortium of around forty industries, research centres and universities in Europe, therefore the fair reward of an exemplary European co-operation.

NB: A detailed IXV article will be published in the next CEAS Quarterly Bulletin.

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# CEAS ANNUAL REPORT 2014

By Fred Abbink, CEAS President



In 2014 CEAS has worked on the following main subjects;

- CEAS Strategy 2015-2020
- Knowledge dissemination
- European links
- International relationships
- Education and young people.

## CEAS Strategy

In September 2015 it will be 10 years since the CEAS Statutes and Bylaws were signed in Hamburg.

It felt like a good idea to prepare the CEAS strategy for 2015-2020 and present it on the next biennial CEAS Conference in 2015.

To this purpose a draft letter was prepared to the Presidents of the CEAS Member Societies with an annex with questions related to the CEAS Strategy 2015-2020. These were discussed and finalized during the CEAS Board of Trustees meeting in June 2014. To discuss these questions, I made dedicated visits to the presidents of the RAeS, 3AF, and DGLR. These visits provided valuable background information about the opinions of these large CEAS Member Societies on the values and special tasks for CEAS. A first result of the reactions of the CEAS Member Society Presidents was provided on the Board of Trustees meeting in October.

## Knowledge dissemination

For the ICAS 2014 Congress in St Petersburg 10 CEAS Member Societies provided over 375 papers. The papers of the ICAS 2014 Congress will be openly made available through the ICAS Website.

The CEAS Technical Committees were active in preparing and organizing a great number of specialist conferences:

- CEAS Specialist Conferences on Aeronautic Subjects were:
  - 20<sup>th</sup> AIAA/CEAS AAC 2014: Atlanta (USA) as part of “AIAA Aviation 2014”, 16-20 June 2014
  - European Rotorcraft Forum ERF 40: in Southampton (UK), 2 - 5 Sep 2014
  - 18<sup>th</sup> Workshop ‘Aircraft noise reduction by flow control and active/ adaptive techniques’, Vilnius (Lit), 25-26 Sept 2014
  - Technical Committee on Aircraft Design (TCAD) Symposium on Collaboration in Aircraft Design, ONERA Toulouse (F), 25-27 Nov 2014
- CEAS Specialist Conferences on Space Subjects were:
  - 10<sup>th</sup> European Space Power Conference, April 2014, Noordwijkerhout (NL)
  - 4<sup>th</sup> Space Propulsion 2014 , May 2014, Cologne (GE)

- 42<sup>nd</sup> Aerospace Mechanism Symposium, May 2014, Baltimore (USA)
- 9<sup>th</sup> Int. ESA Conf. on Guidance Navigation and Control, June 2014, Porto (PO)
- 28<sup>th</sup> Annual European Space Thermal Analysis Workshop, Oct 2014, Noordwijk (NL)
- Workshop on Additive Manufacturing for Space Application, Oct 2014, Noordwijk (NL)

The CEAS Aeronautical and Space Journals play an important role in allowing authors in the nations of the CEAS Member Societies to publish their papers in a peer-reviewed journal. Of the CEAS Aeronautical Journal 4 issues with 38 papers were published and of the CEAS Space Journal 2 issues with in total 12 papers. This was made possible by the great support and leadership of Christophe Hermans (CEAS Branch Chief Aeronautics) and Constantinos Stavriniadis (CEAS Branch Chief Space and Space Journal Chief Editor) and their Technical Committee chairs and supporting staff, together with the invaluable contribution of the Aeronautical Journal Chief Editor Rolf Henke.

And of the CEAS Bulletin 4 quarterly Issues were published. Jean-Pierre Sanfourche (Editor of the CEAS Bulletin) played an essential role in the realization of this important “Face of CEAS”. The CEAS Bulletin amongst others contains interesting articles on actual aerospace subjects and a listing of all important upcoming aerospace events and conferences.

The CEAS 2015 biennial conference, with the theme “Challenges of European Aerospace”, to be held in Delft 7-11 September 2015 is being prepared.

Over 230 abstracts were provided from authors from 26 nations. High ranking representatives from Airbus, Fokker, ESTEC, DutchSpace, AEA, AirFrance/KLM, DLR, NLR, ACARE, CleanSky, SESAR, EDA, LVNL, TU-Delft and RNLAf have agreed to give keynote presentations. The CEAS Programme Committee to assess and select the papers was formed.

The CEAS Gold Award 2015 will be presented to Dr-Ing Joachim Szodruch at the CEAS 2015 Conference.

## European Links

- In July 2014 a meeting was held with the CEAS MoU partner Académie de l’Aéronautique et de l’Espace (AAE) in Paris to discuss the AAE-CEAS cooperation. Items on the agenda were the CEAS Strategy and the CEAS 2015 agenda. AAE will be part of the CEAS 2015 Programme Committee and support the programme with presentations/papers.
- CEAS, together with CIMNE, ERCOFTAC, EUROMECH and EUROTURBO have developed a proposal for

European Collaborative Dissemination of Aeronautical Research and Applications (E-CAERO 2) to the European Commission. To discuss the new CEAS Strategy and the link with the European Commission as well as the E-CAERO2 participation CEAS has invited Dr Dietrich Knoerzer to its Board of Trustees Meeting in October. I am very grateful to Pierre Bescond, (CEAS Vice President for External Relations and Publications), who, assisted by Christophe Hermans (CEAS Branch Chief Aeronautics) and Mercedes Oliver-Herrero (CEAS Director General) for their great efforts that made the CEAS contribution to E-CAERO 2 possible and successful.

- As CEAS President I was asked to become a Member of the Advisory Board, for the preparation of the EU Aerodays in London, October 2015. The first meeting of the Advisory Board was held in London in November.
- On December 10, I was invited as CEAS President to give a presentation on CEAS. At this presentation the common interests of CEAS and EREA and the possibility to make a CEAS-EREA MoU will be explored.

### International Relationships

I am since a long time member of the ICAS Programme Committee and since December 2014 also of the ICAS Executive Committee. This direct link enables an optimum interaction between CEAS and ICAS. At the ICAS 2014 Congress in St Petersburg I was able to discuss the ICAS-CEAS cooperation in the context of the ICAS-CEAS MoU. Furthermore it was possible to provide the CEAS 2015 conference leaflet to all the attendees.

In the AIAA International Activities Committee in St Petersburg it was possible to talk to the new Executive Director of AIAA, Dr Sandra Magnus about the CEAS-AIAA MoU and provide her with information on CEAS and CEAS 2015.

As follow-up of the CEAS MoUs with ICAS, AIAA, AAE, CSA and KSAS it was decided to provide these organisations with versions of all new CEAS Bulletins and Aeronautical and Space Journals.

LAETA (Portugal) became Corporate Member.

### Education and Young People

- CEAS supports the links with the aerospace students through its relation with EUROAVIA. For EUROAVIA Jacqueline Chindea is member of the CEAS Board of Trustees. On May 13 Christophe Hermans gave a presentation on CEAS to the EUROAVIA congress in Delft.
- The CEAS 2015 Conference will be held at the Aula Congress Centre of the Technical University Delft.
- This will enable the aerospace students of the TU-Delft and of the Aerospace Division of the InHolland College to easily attend the keynote lecture in the large auditorium.
- CEAS is working on means to make the papers presented on its biennial conferences as well as of its Specialist Conferences open available to students, young professionals and to its individual members. The Presidents of the CEAS Member Societies strongly support this initiative. The E-CAERO 2 EU project will also initiate activities

towards this objective, and incorporating the aerospace related papers from other more broad conferences as ERCOFTAC, EUROMECH and EUROTURBO.

### General

- In 2014 we have had two General Assembly meetings in 2014 (Paris-Jan 16 and Brussels-Dec 9) and five Trustee meetings (Paris- Jan 17, Brussels-March 4, Noordwijk-June 10, Brussels- 17 Oct and Brussels-Dec 9). At the evening before the Paris General Assembly the CEAS Gold Award was presented by David Marshall to Mr Louis Gallois.
- We had to say goodbye and “thank you very much for all you have contributed to CEAS” to David Marshall and Paul Bailey from the RAeS. David has served CEAS excellently as Trustee Board Member and President in 2013. Paul Bailey served excellently for many years Trustee Board Member and a very capable Vice President Finance. CEAS acknowledges the great services to CEAS they provided.
- I am grateful that Cornelia Hillenherms of DGLR was willing to succeed Paul Bailey in the function of VP Finance. We welcomed David Chinn and Emma Bossom as new RAeS CEAS Trustees.

Because David is also Head of Unit and R&T Coordinator of the European Defence Agency (EDA) the CEAS link with EDA is strengthened.

- CEAS made a first assessment of potential additional European Member Societies and Corporate Members. We could welcome to new Portuguese Corporate Member LAETA.
- Under the leadership of Kaj Lundahl, CEAS Vice President Awards and Membership the selection of the recipient of the CEAS Gold Medal 2015 was prepared and executed.
- A new CEAS Technical Committee on Integrated Air Transport Operations was founded by Prof Ricky Curran and Prof Volker Gollnick. This brings the number of Aeronautical Branch Technical Committees to six:
  - Aero acoustics
  - Rotorcraft
  - Aero elasticity & structural dynamics
  - Guidance, Navigation and Control
  - Aircraft design
  - Integrated Air Transport Operations
- CEAS is preparing a new CEAS Website. Thomas Vermin has finalized the new website design and the testing by the Trustee Board Members has started.

I want to sincerely thank all the CEAS Trustees for their support in 2014. A special thanks goes to Mercedes Oliver-Herrero (and her employer Airbus) for her outstanding work as CEAS General Director and for her great support she has given me.

*Fred Abbink*  
CEAS President December 2014

# CEAS 2015: EVENT AT A GLANCE



Preparations for the CEAS 2015 Conference in Delft (The Netherlands), to be held from 7 – 11 September 2015, are well under way.

Inspiring and influential speakers have chosen the CEAS 2015 Conference to share perspectives that are relevant to you and your organization.

- Lt-Gen Sander Schnitger (Commander Royal Netherlands Air Force)

## Technical sessions

The International Program Committee, with representation of 20 organizations, has reviewed the abstracts handed in.

200 Technical papers will be presented by aerospace scientists and engineers from 26 different nations around the world to share and disseminate the latest scientific knowledge and research in areas like Air Transport, Airworthiness, Clean Space, Collaborative engineering in system design, Future education and training needs, Virtual hybrid testing in aeronautics, Aircraft noise, Aerodynamics, Future of the Air Combat Systems in Europe, Aero elasticity and Structural Dynamics, Space Sustainability, Aircraft handling / flight mechanics, Greenhouse gas emissions, Guidance & navigation, Modelling and simulation, Propulsion integration, Structures & Materials and Unmanned Aerial Vehicles.

## Conference panel: Future of Air Combat Systems in Europe

Many experts in Europe are concerned that, apart from the British-French Future Combat Air System Demonstration Program FCAS DP, presently no plans are being made to prepare the next generation of air combat systems beyond Eurofighter, Rafale and Grippen. The F35 program, although serving a number of Air Forces in Europe, is US-led and will not secure the future of the European Air Combat industry. A number of studies have been conducted in recent years on this critical issue, such as the “FAST4Europe” study by an industrial consortium led by SAAB and by the Air and Space Academy’s as reflected in the white paper “Recommendations to avoid a strategic downgrading of Europe in the field of Combat Aviation” (published at the end of 2013).

The panel will contain presentations from high level actors in the field of Air Combat systems. The talks will address current reflections in Europe, the status of present and future Air Combat Systems across the world.

The session will be moderated by Gerard Brachet, former President of the Académie de l’Air et de l’Espace/Air and Space Academy (2009-2012), current Chairman of its Defense Commission.

## Workshops

The 12<sup>th</sup> European Workshop on Aircraft Design Education (EWADe) will be held during the CEAS 2015 conference. The workshop aims at enhancing collaboration between European lecturers concerned with aircraft design and discuss Aircraft Design problems from a research and education perspective (<http://ewade.aircraftdesign.org/>).

On 10 September 2015, the EU-funded project *AFLoNext*



## Plenary sessions

### Challenges for the European Aeronautical Industry

- Jean Botti (CTO Airbus)
- Hans Buethker (Chairman & CEO Fokker Technologies)

### Challenges for European Access to Space

- Franco Ongaro (Director TEC & head ESA-ESTEC)
- Arnaud de Jong (CEO Airbus Defense and Space Netherlands)

### Challenges to the European Airlines

- Athar Husain Khan (CEO Association of European Airlines AEA)
- Peter Hartman (Vice-chairman Board of AirFrance/KLM)

### Challenges in realizing a Single European Sky

- Florian Guillermet (Director SESAR JU)
- Paul Riemens (CEO LVNL)

### Challenges to the European Aerospace Research and Research Infrastructure

- Eric Dautriat (Executive Director CleanSky)
- Rolf Henke (Member DLR Executive Board, chairman ACARE WG 5)
- Michel Peters (CEO NLR)

### Challenges to European Aerospace Education

- Hester Bijl (Dean TU-Delft Aerospace Faculty)

### Challenges to the European Air Power in Asymmetric Conflicts

- AIR CDRE Peter Round (Director Capability EDA)



2<sup>nd</sup> generation active wing will organize a workshop as a partner in the CEAS 2015 conference. AFLoNext is a four-year integrated project (level 2) with the objective of proving and maturing highly promising flow control technologies for novel aircraft configurations. More details will come up soon! Meanwhile, feel free to visit our website at [www.aflonext.eu](http://www.aflonext.eu).

**Project**

ESWIRP achievements will be presented at the CEAS Air & Space Conference 2015.

The ESWIRP project (<http://www.eswirp.eu/>) has been funded by the European Framework Programme 7 to support the integration of and access to research infrastructure of pan-European interest. It has significantly enhanced the interoperability of 3 key world-class aeronautical wind tunnels, and harmonized, improved and optimized the scientific access conditions thereto: DNW-LLF, ETW and ONERA S1MA.

A central element of the project, besides networking and joint research activities, has been the transnational access (TNA), which has been provided to 4 consortia with a total of more than 100 scientists from 17 different nations.

**Welcome Reception**

Enjoy food and drinks and get to meet with your peers during the reception in the Delft Botanic Gardens. The Gardens are at walking distance from the conference venue.

**Conference diner**

Romantic boating aboard the largest paddle steamer of Europe "De Majesteit" with its steam engines, giant paddles and cozy saloons. Once welcomed on board of De Majesteit you will enjoy the nostalgic atmosphere and the conference diner, while cruising the impressive Rotterdam harbours.

THE PRESTIGE EVENING OF THE FRENCH ASSOCIATION OF AERONAUTICS AND ASTRONAUTICS TOOK PLACE ON 25 NOVEMBER 2014 AT PAVILLON DAUPHINE, PARIS

The 3AF Prestige Evening held on 25 November in Paris has been the occasion to bring together many actors of Aeronautics and Space: military and civil personalities, industry managers, technology experts and scientists.

Army General Jean-Louis Georgelin, High Chancellor of the Legion of Honour, did honour to the 3AF to participate in the ceremony.



A view of the 3AF prestige evening 'Soirée des Etoiles' which took place on 25 November 2014 at Pavillon Dauphine in Paris

The evening was brilliantly moved by Michel Polacco, General Secretary of Radio France, journalist specialized in defence and aerospace matters.

**PRESENTATION OF THE BOOK: '3AF70 – SERVING THE FRENCH AVIATION AND ASTRONAUTICS FOR 70 YEARS'**

After the welcome speech delivered by President Michel Scheller, Bernard Vivier presented the history book '3AF70

– Serving the French aviation and astronautics for 70 years' whose he had conducted the editorial coordination.



In the centre, Army General Jean-Louis Georgelin; on the right, 3AF President Michel Scheller and on the left Michel Polacco



On the right, Bernard Vivier exhibiting the book; on the left, Michel Polacco





This luxurious book of 170 pages at 24x30 cm format, abundantly illustrated, recounts the history of the 3AF – Association Aéronautique et Astronautique de France – from its origins in January 1945 until today. It is organised around six main chapters:

1. A 70 years heritage association heritage of French aviation and astronautics history
2. The 3AF, the French Aerospace Learned Society
3. Disseminating knowledge and serving members more closely

4. International action
5. Serving the aerospace industry
6. Preparing for the future

To order the book: address a mail to [secr.exec@aaaf.asso.fr](mailto:secr.exec@aaaf.asso.fr)

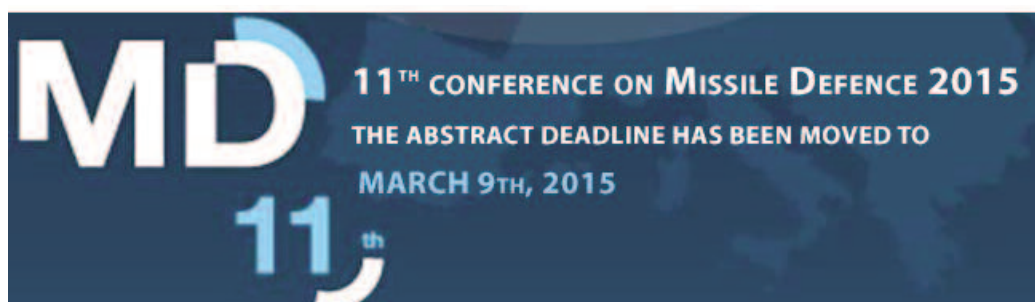
## PRIZE 2014 PRESENTATION

### PART ONE

- Prizes presented by Christian Mari, President of the Prize Attribution Jury:
- Young Professionals Prize to Pierre Auzillon, Safran/Snecma, and Antoine Durant, MBDA
- Success Prize to X3 Project Team, Airbus Helicopters
- Operations Prize to Lt-Col. Christophe Fontaine, French Air Force
- SME Prize to Poly-Shape
- Aeronautics Prize to Prof. Thierry Poinot, CNRS
- Astronautics Prize to Laurent Renaud, Dassault Aviation

### PART TWO

- Prizes presented by General Jean-Louis Georgelin:
- Aeronautics Grand Prize to Olivier Zarrouati, Executive Board's President of Zodiac Aerospace
- Astronautics Grand Prize to Thierry Michal, Technical Director of ONERA
- Aeronautics Special Grand Prize to Antoine Bouvier, President and Chief Executive Officer of MBDA
- Astronautics Special Grand Prize to Jean-Jacques Dordain, Director General of ESA



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THE EREA (ASSOCIATION OF EUROPEAN RESEARCH ESTABLISHMENTS IN EUROPE) ANNUAL EVENT WHICH TOOK PLACE ON 9 DECEMBER 2014 AT THE STANHOPE HOTEL IN BRUSSELS WAS A SPECIAL CEREMONY CELEBRATING THE 20<sup>TH</sup> ANNIVERSARY OF THIS ASSOCIATION

**THE WELCOME ADDRESS WAS DELIVERED BY JOSEF KASPAR, EREA CHAIRMAN**

“Dear Ladies, Dear Gentlemen, Distinguished Guests, Friends,

I am really happy that I can welcome you at the occasion of the EREA Annual Event, here in Brussels. Let me remind few important moments for EREA which happened during this year – year of the FUTURE SKY DAYBREAK.

Yes. One of the most important ideas which were brought into reality was our flag ship - Joint Research Initiative – FUTURE SKY. We worked hard on this a many of months and during this year we have achieved a great success. First stage of the Joint Research Initiative – FUTURE SKY SAFETY - was approved by European Commission and launched. We have opened a new era in partnership development between research establishments, universities and industrial players, where we raised our national interest to European level, fully supporting European goals. Nowadays we are deeply working on further FUTURE SKY pillars and we believe in successful EREA participation in other projects within Horizon 2020.

EREA as keystone of aerospace future in Europe need to play more and more important role in the development of industrial solutions and international business. To support it we take care of professional relations with European organisations such as ACARE, ASD, EDA and EASA.

Aviation is not one man show it is global game and I think that EREA has also opportunities outside of Europe. To support this I realized number of meetings to make EREA more recognizable for industrial and political community. About possible cooperation I discussed on the west side of the world in US with Mike Beebe – governor of Arkansas and Marion Blakey - president and CEO of US Aerospace Industries Association. In autumn I discussed RaT cooperation on the east side of the world in China with Zhong Mian, vicegovernor of Sichuan province and industrial representatives from the aviation cities Chengdu, Guanghan and Miayang.

Why I think that we can provide aviation industry with valuable offer?

Because our EREA research establishments:  
 Employ critical mass of experts - approximately 4 500 in aviation and totally 9 500 in aerospace;  
 Every year we expend approximately € 1.3 billion for RTD;  
 Every year we disseminate our scientific and technical results by 1 500 articles in worldwide refereed journals;  
 Every year we protect more than 300 inventions by patents.

This is our contribution to sustainable development technical intelligence and business in aviation worldwide.

Aviation is a never ending human's dream, to enjoy the space between the Earth and the Universe. EREA works on materialization of these dreams. We really love it...

Dear Ladies, Dear Gentlemen, I wish you a magic Christmas and a successful year 2015.”



9 December 2014 evening in the reception room of the Stanhope Hotel of Brussels: Josef Kaspar, EREA chairman, delivering his welcome address before a large audience of which the first ranks only appear on the photography.

**Josef KASPAR**



**Josef Kaspar was born in 1970 in the Czech Republic, permanently resident in Prague.**

**Education:**

He studied at Czech Technical University in Prague, Faculty of Mechanical Engineering, where he specialized in aircraft design, project management, financial management and intellectual property management.

**His current positions are:**

- Board Chairman and General Director of VZLU - Aerospace Research and Test Establishment.
- President of ALV - Association of the Aviation Manufacturers of the Czech Republic.
- Chairman of EREA.
- Member of General Assembly of ASD - Aerospace and Defence Industries Association of Europe.
- Member of Research and Technology Commission of ASD.
- Member of Expert Commission for Technical Sciences and Engineering (Advisory Body of the Research and Development Council of the Czech Government).
- Presidium Member of AVO - Czech Association of Research Organizations.



**SPEECH DELIVERED BY AIR COMMODORE PETER ROUND, DIRECTOR CAPABILITY, ARMAMENT & TECHNOLOGY, EUROPEAN DEFENCE AGENCY (EDA)**



Peter Round

“ Thank you for inviting me to speak to you today. As an aviator myself, it is a pleasure to address this audience of European aeronautics researchers, and I am particularly looking forward to hearing of the innovations from the winners of this year’s EREA Young Researchers Science Slam. I am sure many of you will be wondering what exactly EDA is and can do for you: something I hope to be able to answer over the next 15 minutes, with a particular focus on how we facilitate technology development in the Agency. The European Defence Agency was established under a Joint Action of the Council of Ministers on 12 July, 2004, "to support the Member States and the Council in their effort to improve European defence capabilities in the field of crisis management and to sustain the European Security and Defence Policy as it stands now and develops in the future.”

**THE EDA'S FOUR FONCTIONS**

The European Defence Agency is ascribed four functions, covering:

- developing defence capabilities;
- promoting Defence Research and Technology;
- promoting armaments co-operation,
- and creating a competitive European Defence Industrial Base.

The Agency also supports Ministries of Defence in their interactions with other European institutions and keeps them up-to-date regarding wider EU policies that have implications for defence.

EDA provides a unique, tailored approach to capability cooperation, turning member states’ requirements into capabilities. We can, and do, start projects with only two participating member states – although usually there are many more.

In order to maximise our effectiveness, we work with many stakeholders, from those involved in capability development (such as NATO or OCCAR); to our key partners in coordinating military & civilian activity (such as the European Commission or the European Space Agency). We coordinate with Industry through ‘The AeroSpace and Defence Industries Association of Europe (or ASD)’. We also have a number of Administrative Arrangements with non-EU countries including Norway, Serbia and Switzerland which enable much work to be done together. The Agency may only employ some 130 staff. But through various networks of national experts the Agency currently involves around 4,000 defence specialists organised in Integrated Development Teams, and Project Teams. Additionally, Ad Hoc Working Groups comprised of national experts can be formed for any given subject.

On the R&T side, EDA moderates networking forums called CapTechs – about which more later - for experts from government, industry, small and medium enterprises (SME) and academia to generate R&T projects to meet agreed capability needs.

Once a group of experts has been formed, the majority of projects follow a typical lifecycle of collaboration with initial scoping activities leading to agreed targets, which form the

## Capability Programmes

Remotely Piloted Aircraft Systems (RPAS)

Air to Air Refuelling (AAR)

Cyber Defence

Governmental Satellite Communications (GO SATCOM)

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basis of the Programme Arrangement's Common Staff Requirements and Business Case. The most successful collaborative projects consider the entirety of a capability, and make steps to address aspects such as training & maintenance in a collaborative manner.

Experience has also shown that those collaboration projects which identify a Lead Nation to take ownership and drive the project forward are on the whole far more successful.

Last year saw some important tasking for the Agency from the European Defence Council of 19 December. That defence was on the Agenda at all was a significant step; increasingly, it is at the mercy of developments in other EU policy areas.

**FOUR MAJOR NEW CAPABILITIES**

The Council addressed defence across the full spectrum of interlinked issues (policy, capabilities, operations and industry) and endorsed four major new capabilities programmes (see page 11): Remotely Piloted Aircraft Systems (Drones), Air-to-Air Refuelling, Cyber Defence and Satellite Communications. All but Air-to-Air Refuelling are civil-military in nature and will rely on dual-use technology.

**> Remotely Piloted Aircraft Systems (RPAS)**

Drones (RPAS) are an excellent example of how different instruments in the EU framework can be used in a complementary manner to support defence. Against a single objective 'to actively support those Member States who wish to set up a European-made, efficient and competitive RPAS capability which can be easily adapted for national requirements', SESAR Joint Undertaking together with support from EUROCONTROL & EDA are attempting to answer the question "what has to be done to insert RPAS in the Single European Sky". We are also working to agree a set of requirements... which we stick to once set. On air-worthiness, member states have now shared their certification processes preparatory to drawing up harmonized safety objectives... being ever-mindful of work being carried out in parallel for civilian RPAS. Current RPAS user member states have also compiled lessons from operational experience and exchanged information on training processes. We expect member states to be in a position to make tangible commitments by 2016.

**> Air-to-Air refuelling**

Air-to-Air Refuelling is a critical enabler for air power projection. It is required for sustained air combat operations yet Europe can field only 42 aircraft of 10 different types; this compares with the US count of over 550 aircraft of merely 3 types. A major milestone was reached in early September with the signature of a Technical Assistance Agreement between EDA, Boeing and Italy. This agreement allows EDA to play a key role in the certification process by facilitating data exchange for KC767 certification.

On Strategic Tanker Capability, currently, work is taking place to analyse industrial responses to an RFI, assessments of environmental and organizational issues, as well

as consideration of potential synergies with other programmes.

**> Cyber Defence**

On Cyber Defence, EDA developed the Cyber Defence Research Agenda to deliver a risk and gap analysis, indicating which technologies will be required within a 10 year timeframe, and how to make them available – in effect, a research roadmap. In addition, a strong focus has been on the human element of Cyber Defence – notably training and exercises. Training courses are being developed now to address those areas highlighted in an analysis of cyber defence training needs which EDA conducted in consultation with various stakeholders. On the technology front, EDA is conducting a feasibility assessment for the better detection and mitigation of advanced malware in military networks known as Advanced Persistent Threat.

**> Satellite Communication Capability**

On the GOVSATCOM programme, the Common Staff Target was recently presented to the EDA Capability Directors. It is the first milestone towards a comprehensive programme for participating Member States that wish to contribute to a future governmental satellite communication capability in the 2020-2025 timeframe. Of note – this work is not looking at the hardened Military SATCOM, which remains a national capability. Europe's next step will be the programme preparation phase which will look at aspects such as scope, time and cost & acquisition regime. The goal will be to define the best value for money on a solution able to fulfil defence needs.

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*> EDA will report on progress made against all these 4 projects at the June 2015 Council meeting.*

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**INDUSTRIAL BASE**

The Council also addressed the industrial base, recognising that 'defence industry matters'. European Defence departments are facing the twin challenges of declining budgets and rising security risks. As Barack Obama said during his visit this year to Brussels, "Freedom does not come for free". There is a growing recognition that defence industry cannot be taken for granted.

What does Europe stand to gain by a strong Defence Technical and Industrial Base?

Well, industry is a driver for growth and innovation with an impact on the wider European economy. Today, European defence industry generates about 4 hundred thousand jobs and has an annual turnover of about € 100 billion. Then there are the numerous technological spill-overs to the civilian domain such as Galileo – Europe's satellite navigation system.

But Europe will not be credible without the ability to produce cutting-edge next generation capabilities - capabilities which very much rest on having a defence industry which is able to innovate, provide cost-effective solutions

(and compete) at a global level. And for that, industry needs security of supply.

**RESEARCH, CERTIFICATION & STANDARDISATION, SMEs, SECURITY OF SUPPLY**

In the European Council conclusions, a specific chapter was dedicated to strengthening Europe’s defence industry and included work to be done in areas such as Research, Certification and Standardisation, SMEs, and Security of Supply.

So, what is EDA’s role?

- EDA is identifying those key industrial capabilities that are crucial for the development of future capabilities, paying particular attention to lower-tier suppliers in Eastern Europe.
- EDA is identifying R&T priorities and critical defence technologies as well as looking into the prospects of defence-related research at EU level – about which more later on.
- EDA provides tailored support to Small/Medium Enterprises based on a dedicated Action Plan and wider Supply Chain Action Plan.
- And finally, we are facilitating access to European funding for dual-use research.

The defence industry in Europe today is the product of decades of past investment, but action by all players is needed now to ensure that defence industry continues to deliver the requirements of tomorrow.

**EDA FACILITATES COOPERATION**

EDA facilitates cooperation, including by working on enablers such as harmonising standards and certification procedures. The benefits of these will be efficiencies and economies for suppliers and customers alike. The financial crisis is an incentive to cooperate in order to be more efficient, but not an alibi to do more with less.

Cooperation is not a natural reflex; this is why the call by the Council on working on pooled acquisition and non-distorting fiscal incentives is so important.

Among the priority Pooling & Sharing projects are Air-to-Air Refuelling, the Helicopter Training Programme, maritime surveillance, and the EU SATCOM market.

In order to ensure a systematic approach, a “Code of Conduct on Pooling & Sharing” is followed. The Code comprises a series of actions to support cooperative efforts of EU Member States to develop defence capabilities, and embed them in Member States’ planning and decision-making processes. They are to be implemented on a national and voluntary basis, in line with defence policies of Member States.

The key is to ensure complementarity and not duplication. Whilst ‘Pooling & Sharing’ is an EU approach driven by Member States, in which EDA acts as a facilitator, EDA also maintains a continuous dialogue with NATO to avoid duplication of effort.

Earlier this year Jane’s Defence Weekly ran an important article entitled ‘Learning to share’. The report was optimistic: whilst acknowledging that progress had been slow and

there was a long way to go, it was recognised that both EDA and NATO were beginning to make progress in military capability cooperation... and through careful and on-going collaboration, both were avoiding duplication of efforts. As a NATO source told the magazine: Everything’s being carefully parcelled out between us... we do this, you do that.

**THE CAPABILITY TECHNOLOGIES AND THE CAPABILITY DEVELOPMENT PLAN (CDP)**

As I mentioned earlier, EDA organises its R&T priorities in different expert groups called Capability Technologies (commonly known as CapTechs). Each of our CapTechs focusses on particular technologies associated with different military domains.

The CapTechs aim is to propose R&T activities in response to agreed capability needs and to generate projects accordingly. How do we derive agreed capability needs? Well, the European reference which enables an objective assessment of capabilities and requirements needed for Common Security and Defence Policy operations in the future is the EU Capability Development Plan (CDP).

The CDP is not a ‘Plan’ in the traditional sense, describing the number of units or the amount of equipment Member States should have at their disposal. Rather it provides a view of future capability needs, taking into account the impact of future security challenges, technological development and other trends.

A major revision to the Plan was published this autumn. Both participating Member States and the various stakeholders in Brussels contributed at all stages of development.

**The substance of the CDP Revision includes:**

- A new assessment of shortfalls within the Headline Goal Process.
- Future Capability Trends, for which a war-gaming exercise was conducted with Member States to validate the findings – a novel approach for this kind of long term work.
- Revitalisation of the Collaborative Database (CODABA) on Member States’ plans and programmes and integration into the CDP.
- And finally, important work has been done in the domain lessons from operations, something which constitute a “reality – check” of the findings.

All the CDP strands culminated in a list of capability development priorities, which – together with the output of the European Council - will inform the Agency’s work into the future.

Whilst there is a list of some 16 CDP Priority Actions, those of particular interest to this audience are gaining information superiority through RPAS, enabling expeditionary operations through inter-theatre air capabilities, and developing the cross-cutting driver of space-based information systems.

Of course, just because Member States have identified an area as one needing priority action at European level does not mean that it is easy to launch initiatives to address the capability improvements needed.

**FACILITATING TECHNOLOGY DEVELOPMENT AT EUROPEAN DEFENCE LEVEL**

I promised at the start that before I finished I would focus on how the Agency facilitates technology development at a European Defence level.

We are already seeing benefits from a recent internal reorganisation which has moved capability development into the same area as technology.

Whilst EDA R&T projects are currently funded on an ad-hoc basis by member states, the R&T planning process itself is evolving. In the short term, the CDP priority actions will feed into R&T prioritised goals, as will the Critical Defence Technologies list (or 'CDT') which was endorsed by EDA's R&T Directors this year.

The most significant change introduced by the CDP revision in the medium to long term is the Preparatory Action. The scope of the Preparatory Action is currently being defined by the commission and EDA along with other stakeholders, and has the potential to provide potentially significant funding at an EU level for R&T with an explicit link to Capabilities. There is a balancing act to be achieved here; we need to focus on the short term delivery of the goals set by the European Council on Security & Defence, whilst keeping in mind that the Preparatory Action will require us to engage in major strategic activity.

Android have a slogan 'Together, not the same'. It's a strong message, which applies as equally to the Member States of the European Union, as it does to mobile phone apps. As a facilitator of cooperation within Europe, the Agency can help tie together many disparate capability needs right from the first investigations into available technology. We truly are 'Stronger Together', to finish with the Agency's motto.

Thank you for your time. ”

**PRESENTATION OF THE WINNERS OF THE AREA YOUNG RESEARCHERS SCIENCE SLAM 2014 AND EREA AWARD FOR BEST PAPER**

For the third consecutive time, ONERA – French Aerospace Lab – has received the EREA Award for best scientific paper. The subject of the paper is:

***'Viscous-plastic constitutive equations of combustion chamber materials including cyclic hardening and dynamic strain aging'***

The authors are:

- J.-L. Chaboche, A. Gauber, and P. Kanouté from ONERA;
- A. Longuet, from Safran Group Snecma Melun-Villaroche;
- F. Azzouz and M. Mazière, from Materials Centre – Mines Paris tech.

**CEAS GOLD AWARD MEDAL CEREMONY**

CEAS PRESIDENT FRED ABBINK RECEIVED FROM THE HANDS OF DAVID MARSHALL THE CEAS GOLD AWARD MEDAL.

Responding to the presentation and congratulations message expressed by David Marshall, former CEAS President and former RAeS President, Fred Abbink delivered the following speech:

“Ladies and Gentlemen,

First of all I want to thank the people who nominated me for this prestigious CEAS Award. I consider it a great privilege to receive this CEAS award, especially looking at the former recipients.

I was lucky to be born at the end of the Second World War and to grow up in a time period of great Dutch and European Aerospace developments.

Working at the Netherlands National Aerospace Laboratory NLR for 40 years, I could become involved in the ESA Spacelab project, in the NLR-NASA cooperation on advanced ATM and in the Fokker 100 and Fokker 50 programmes. It was great to be able to teach as part-time professor, aircraft instrumentation and avionics from 1981 till 1998 at the Technical University of Delft and to work with the highly motivated and talented aerospace students.

But it was a special pleasure to work in the European and Transatlantic Research Cooperation programs. To meet and work with so many highly qualified researchers and engineers from so many countries. In the NATO AGARD Flight Mechanics Panel and later in the NATO Research and Technology Board, in the GARTEUR Helicopter Group of Responsible Members and later in the GARTEUR Executive Committee, in the EREA Programme Committee and Facilities Committee, in the EU Framework programmes (from Brite Euram in the 2nd FWP in 1990, till the writing of EU Vision 2020 for the 7th Framework programme), in the DLR-NLR DNW Wind Tunnel cooperation, the European Wind Tunnel Project ETW, in the bilateral DLR-NLR research programmes and the founding of AT-One, and after my retirement in Dec 2009, the European cooperation in Clean Sky and SESAR.

And finally I had the opportunity to work with the world wide Aeronautical Societies in the Council of Aeronautical Sciences (ICAS) and since 2010 also in the Council of European Aerospace Societies (CEAS).

Since the 1950's France, Germany, Italy, the Netherlands, Belgium and Luxemburg founded the European Coal and Steel Community and later the European Economic Community, Europe has come a great way.

We have now a single European Market and many of us enjoy the privilege of a single European Currency. We enjoy the ease of travel throughout the EU.

Europe has also obtained a great position and a great potential in aerospace.



There are many excellent examples of European cooperation and sometimes even integration:

- European cooperation and integration in space through ESA with excellent examples of European Space-based weather forecasting, navigation and surveillance through EUMETSAT, Galileo and GMES;
- Industrial European Aerospace consolidation and cooperation, providing high quality export products and European access to space through Airbus and Arianespace;
- Harmonizing EU defence capabilities and technology through the European Defence Agency (EDA);
- Defining and developing the future European Air Traffic Management at the upper airspace through EUROCONTROL;
- Joint European certification and safety cooperation through EASA;
- European coordination and integration of large aeronautical research programmes through the EU Framework Programmes, Clean Sky and SESAR;
- European Wind Tunnel cooperation through DNW and ETW;
- European Cooperation of the Research Establishments through EREA.

That is all very necessary but maybe not sufficient. As an example our three military fighter programmes (Eurofighter, Rafale and Gripen) shows that steps have to be made. In the field of European military capability much improvement can be made.

The rest of the world tries to strengthen its position. If we look at the developments in the USA, Canada, China, Brazil, India and Russia it is obvious that Europe can maintain its safety and high standard of living only if we can maintain excellent education, joint research and technology development and the most efficient production technologies. We should maximally support our airline's industry, have a Single European Sky and united, effective and efficient Air Navigation Service Provision. Also we could further increase the efficiency and effectiveness of our military programs and operations. Hopefully Europe will be able to reach these requirements. We have come a long way since the end of World War 2, but we still have a long way to go.

Maybe one day we will come as far as the first US President George Washington stated in the 18th century; "Someday, following the example of the United States of America, there will be a United States of Europe" and what was said by one of the EU Founding Fathers "Winston Churchill" in his famous speech at the University of Zurich on 19 Sept 1946: "We must build a kind of United States of Europe". In 1950, Churchill called for the creation of a European Army "[...]under a unified command, and in which we should all bear a worthy and honourable part". Maybe one day we will have our single European Sky with a single European Air Navigation Service Provider, a single European Airline, a single Europe Air Force, a single European Aerospace Research Establishment and a single

European Aerospace Society.

When that day has come, many things that are now still fragmented can become further united to strengthening of the European Industry and of the European global policy enforcement to the benefit of all people in Europe.

Ladies and Gentlemen let me conclude:

It is a great privilege to have been able to work in so many European Aerospace programs and organizations, to promote European Aerospace Cooperation and to get students and young professionals enthusiastic for aerospace and European Cooperation.

I consider myself very lucky to have been living in a time with so many opportunities and to have been able to contribute. And I like to thank you all for this prestigious CEAS Award.

And it is especially great to receive this award among so many EREA and CEAS friends.

Thank you very much for providing me with this great CEAS honour. ”

*Fred Abbink  
Brussels. December 9, 2014*



On the left David Marshall presenting the CEAS award 2014 to Fred Abbink, on the right.



From left to right: Christophe Hermans, Fred Abbink and David Marshall.



Please find here below the editorial from Patrick Ky in the Issue 6 (December 2014) of the CEAS magazine "On Air".

## SAFETY FIRST



2014 has been a very challenging year for EASA and for aviation safety in general. The disappearance of MH370, the dramatic accident of MH17, the radar interferences over central Europe and the near mid-air collisions over the Baltic sea have reminded us that safety can never be taken for granted.

The safety of flying passengers is at the core of EASA's role. This is precisely why the Agency made a number of proposals in 2014:

- Technical solutions for flight tracking, Voice recorders and Underwater Location devices in line with the framework set by the International Civil Aviation Organisation (ICAO),
- to build a European alert system to assess, qualify and share the information available in order to help airlines perform their risk-assessment when flying over conflict zones,
- a new technical approach to controller-pilots communication via Data-Link, in order to solve the current operational problems .
- a comprehensive investigation report on the radar interferences situation of last summer.

Safety first is also the reason why EASA has adopted a new approach towards General Aviation in order to change fundamentally the way the sector is regulated and overseen in Europe.

In 2014, we certified the Airbus A350 which is about to be delivered to Qatar Airways. It is the first commercial aircraft entirely certified by EASA from the application to the type certificate. Since the application received from Airbus in April 2007, EASA engineers and test pilots have actively and intensively worked to ensure that this type of aircraft is safe, covering the full range of the programme from structure to avionics, from cabin safety to flight tests etc.

Aviation is constantly evolving and reinventing itself with innovative business models and new technologies in order to achieve greater efficiencies. In turn, regulators are faced with the challenge to be more efficient and flexible, thus enabling further growth for aviation. Effective since the 1st of September 2014, EASA's new organisation lays down the Agency's foundations for the next 10 years and is well suited to meet the challenges of the aviation sector.

2015 is on a course to be yet another challenging year: there will be a proposal from the European Commission for the revision of the EASA founding regulation, the work on Remotely Piloted Aircraft Systems at European level promises to be substantial. Finally the ICAO High Level Safety Conference will set new objectives for aviation safety.

*Patrick KY*  
EASA Executive Director



# TRANSPORT SAFETY: SOCIETAL CHALLENGES, RESEARCH SOLUTIONS

Genova, 4-5 December 2014

An event of the Italian Presidency of the EU  
Co-organised by the European Commission and the  
Italian Ministry of Education, Universities and Research

*Transport professionals, researchers, stakeholders and policy makers involved in all modes of transport met in Genova, Italy, on 4-5 December 2014 to assess the future needs for transport safety research and identify priorities for activities in Horizon 2020 and beyond. The Conference participants adopted the following final statement:*

## Draft final statement

The European Commission **White Paper on Transport**<sup>1</sup> sets ambitious safety objectives within a coherent policy framework: moving close to zero fatalities in road transport by 2050, halving road casualties by 2020 and ensuring that the EU remains a world leader in the safety of all modes of transport.

In order to help achieve these objectives, the EU Framework Programme for Research and Innovation (2014-2020), **Horizon 2020**<sup>2</sup>, aims at 'reducing accident rates, fatalities and casualties' in each mode and in the whole transport system by furthering knowledge and awareness, and by developing technologies, products, services and solutions that reconcile safety with efficiency and user-friendliness.

The Horizon 2020 specific programme indicates that *'this will be achieved by addressing aspects inherent to the organisation, management and monitoring of performance and risk of transport systems and by focusing on the design, manufacturing and operations of aircraft, vehicles, vessels, infrastructures and terminals. The focus will be on passive and active safety, preventive safety and enhanced automation and training processes to reduce the risk and impact of human errors. [...] Activities will also focus on improving the safety of all road users, especially those at greatest risk, particularly in urban areas'*

In the context of rapid technological progress and changes in behaviour and demand patterns, it is important to identify evolving needs and to define a clear European Agenda for transport safety Research and Innovation, which should be driven by consistency with the policy objectives and a strong focus on the future deployment of results.

The Research and Innovation agenda should, in particular, take into account the following considerations:

**1.** A multi-modal approach needs to be adopted regarding

the collection of accident data, given that the causes of accidents and incidents can be similar for the four transport modes - road, rail, waterborne and aviation - and that there is a great potential benefit in sharing best practice between transport modes. Research should help define a common methodology and a European standard for data collection, sharing, processing and analysis, including for road safety, to form the basis for sound legislation.

**2.** Since human factors are one of the major causes of incidents, specific research in the field of distraction, stress and fatigue should be supported, with the aim of implementing appropriate mitigation measures and technologies, and developing awareness about the factors to be kept under control.

**3.** Increasing support for the Human Machine Interface and automation in all transport modes is expected to reduce the risk of incidents and limit the effects of human error. A roadmap to automation should be defined to determine which technologies should be implemented in priority order, taking into account the safety benefits of each system and their combined effect on both the fleet and infrastructure.

**4.** At the same time, the introduction of these technologies should take into consideration possible unintended impacts, such as an over-reliance on automated devices, distraction and cognitive overload, together with the need for adequate levels of cyber-security, for proper redundancy to cope with possible failures, and for effective communication, education and training to ensure social acceptance.

**5.** A harmonised management of safety-relevant traffic data is necessary, including validation of sources, ownership of data, privacy and liability issues. Research is needed to achieve an integrated approach to data governance, essential to ensure a seamless and safer transport system.

**6.** Due consideration should be taken of the safety impact of infrastructure design, construction and maintenance and its overall contribution to safety on a modal and cross-modal basis.

**7.** In prioritising research efforts and in defining a roadmap to implementation, the primary focus should be on those measures that can be deployed in the short-medium term and are most likely to yield rapid safety gains, taking into account the shorter renewal cycles of certain components of the transport system. However, longer term research objectives and disruptive technology breakthroughs should not be neglected.

**8.** While safety is, and should remain, a paramount objective for each mode and for the transport system as a

1. Roadmap to a Single European Transport Area – Towards a competitive and resource efficient transport system, COM (2011) 144 final.

2. Proposal for a Council Decision establishing the Specific Programme implementing Horizon 2020, COM/2011/081



whole, road safety deserves particular attention, given the disproportionate occurrence of accidents and casualties.

9. Complementing the above, for each of the modes, European Transport safety research and innovation priority actions have also been identified as follows:

### Road

- Addressing behavioural changes and adapting education and training of road users to these changes. Safety conditions for Vulnerable Road Users; safe inclusion and accessibility for the elderly. Virtual Human Body Models for safety improvements of vehicle performance.
- Safe transition from driver assistance to automated driving through: advanced Human Machine Interfaces; driver acceptance and adaptation; infrastructure design and equipment; training schemes; regulatory and legal environment.
- Improved traffic data/information handling for real time traffic management and advanced incident detection and rescue systems. Understanding accident causation and counter-measures. Accident evidence and statistical information for policy making, including for the purpose of optimising preventive measures and addressing the burden of injuries.
- Safer road design, road maintenance and advanced traffic management systems.

### Rail

- Progressive automation of the Control, Command and Communication systems.
- Improved management of critical interfaces (e.g. at level crossings, stations and work zones).

- Harmonised verification and certification/authorisation of safety management systems, vehicles, etc.
- Intelligent and consistently applied fall-back systems to assure safety during degraded mode, designed into every critical sub-system and component.

### Waterborne

- New conceptual designs of vessels and systems and a new approach to emergency response.
- New safety devices and technologies for the evacuation of large passenger ships, for black-out mitigation, for fire proofing and for establishing salvage friendly ships.
- New and improved systems for the surveillance, monitoring and management of maritime transport and other seaborne activities.
- The extension, integration and optimisation of traffic information and communication systems.

### Aviation

- Advanced sensing, monitoring and alerting functions, supported by 'big data' system processes, capable of predicting and mitigating technical and operational issues, including weather, traffic and in-cabin hazards.
- New designs, technologies and training processes that support decision making and 'human centred' automation.
- New certification techniques, safety methodologies, organisational principles, and a holistic safety system approach, from design to operations, across all stakeholders and components, including search and rescue and remotely piloted aircraft systems.
- Safety and security must be considered jointly.

## HEATHROW OPENS SESAR AIRPORT OPERATION CENTRE



**An Airport Operation Centre (APOC), based largely on the SESAR developments, opened its doors for business at Heathrow Airport in December 2014.**

The Heathrow facility supports frontline operational teams and oversees the Airport Operations Plan (AOP), allowing for an improved management decision-making process for servicing and controlling airport flight movements. Both the APOC and AOP at Heathrow are very much based on development activities performed within the SESAR Programme for Research & Innovation, which aim to bring together the operational planning, monitoring and oversight of an airport in one place.

*"We hope that the example of Heathrow will prompt future uptake of SESAR concepts and solutions by other airport actors in Europe"*, said Florian Guillermet, Executive Director of SESAR Joint Undertaking.

The APOC will see the complete Heathrow picture, seeking



to avert problems before they happen, and managing airport performance in a collaborative way. With multiple stakeholders contributing to the decision-making process,

APOC produces results that are best for the airport as a whole. Instead of islands of potentially conflicting decision-making, there is one over-arching process that balances the business priorities and strategies of all airport stakeholders. APOC keeps the airport flowing by matching resources and facilities to changes in demand or schedule. It does the job in real time, and the process is completely transparent.

A centre piece of APOC is two huge video walls made up of 60 high definition screens which monitor the entire airport including security queues, access roads, baggage halls, and the airfield itself.

## Overview of APOC roles

Function	Role	Overview
Airport Operations	Airport Operations Manager (AOM)	Leads the operation and its participants to operate in a dynamic and collaborative manner. Line manages both the Lead Ops Co-ordinator and the Co-ordinator. Leads all other roles within APOC on a daily basis.
	Passenger Flow and Planning Manager	Co-ordinates all stakeholders and third party suppliers, influencing them to plan ahead and adapt their plans as the schedule alters. Works closely with the Security Flow Manager to manage the flow of passengers.
	Operations Lead Co-ordinator	Handle all calls, radio messages, system alarms and notifications coming into APOC and provide initial response to general enquires and emergency calls, dispatching required resources to attend any incidents or faults. They co-ordinate the operation.
	Operations Co-ordinator	Operations Co-ordinators specialise in handling calls requiring emergency response, ranging from ambulance requests to emergency aircraft landings. They also respond to general enquiry calls and support operatives taking fault notification calls.
Landside	Surface Access Flow	Provides airport wide support to ensure landside roads, forecourts, passenger tunnels and other landside locations are safe and fully effective at all times. The Traffic Flow Controllers will rotate through this position as part of their daily activities.
Airside	Aircraft Flow Manager (AFM)	Provides a continuous stream of aircraft to and from each terminal.
	Senior Operations Controller (SOC)	Manages the day-to-day operation of the Stand Allocation Unit (SAU). SAU is the key interface between airlines, handlers, air traffic control and the airfield in Terminals 1 to 4. In Terminal 5, British Airways manages its own stand allocation in conjunction with the SAU.
	Operations Controller (OC)	Allocates aircraft stands in a way that maximises the use of available resources, taking into consideration the preferences or special requests of airlines, to meet customer expectations.
Security	Security Flow Manager	Is a member of the security scheduling team. The role manages the resource plan on the day, constantly assessing and balancing supply with demand. The role assesses and forecasts flows through security and control posts.
Customer Relationship Management	Resource Manager (Coaching, Passenger Service Agents, Passengers with Reduced Mobility. Supplied by Omniserve)	Liaises with the Omniserve resources on the ground delivering passenger service, coaching and PRM services. Ensures resources are deployed to best deliver passenger experience and effective flow of passengers.
Baggage	Baggage Service Manager	Manages the operational delivery of all baggage performance during operational day. This includes direct bags from check in, arriving bags terminating in Heathrow and transferring bags using Heathrow as a hub.

Baggage	Babcock Operations	There are three Babcock roles present within APOC. Babcock APOC Process Manager (PM) / Babcock Operator (OP) support the dynamic operational delivery of all baggage performance during operational hours. There is also a Performance and Planning Supervisor (PPS) who strategically manages the baggage loading allocation process and engages with relevant stakeholders.
Engineering	Engineering Help Centre Duty Manager (EHCDM)	Responsible for the management of the Engineering Help Centre (EHC) operation. The EHCDM conducts monthly 121's with their direct reports feeding back their performance against the Advisor dashboard.
	Engineering Help Centre (EHC) Advisor	The Engineering Help Centre Advisor is responsible for answering inbound calls from internal and external customers at Heathrow who wish to log a fault or have an enquiry regarding Engineering.
	APOC Control Engineer (ACE)	Accountable for ensuring the operability of the Engineering maintained assets across Heathrow at all times, through delivery of the Engineering Maintenance plan. Supports the Airport Duty Engineer in delivering Business Continuity, Incident Management and Business Recovery, particularly during major incidents.
	Airport Duty Engineer (ADE)	Responsible for ensuring that every asset across Heathrow is working to the appropriate level to effectively support the airport's operation. Responsible for engineering Business Continuity, Incident Management and Business Recovery, particularly during major incidents or those causing a significant business impact.
IT	IT Capgemini Service Delivery Manager	Through the IT outsource contract Capgemini are responsible for running the bulk of the IT services - delivery of all day-to-day IT operations including service management, helpdesk, applications maintenance and support of the network datacentre and desktop maintenance and support.
Police	Metropolitan Police	Having the Metropolitan Police situated in APOC, will enhance the communication between both organisations. The Police will work closely with the AOM (Airport Operations Manager) and Lead Controllers
NATS	NATS	This role is the NATS presence in APOC and is designed to act as the Air Traffic Control point of contact for Heathrow Airport.
Border Force	Border Force Liaison	Point of liaison with Border Force, sharing operational information and supporting the most effective deployment of Border Force resources across Heathrow.
MET Office	Heathrow Meteorological Specialist	Responsible for forecasting and advising Heathrow and the significant stakeholders of any weather event that will cause disruption and delays at the airport.
Communications	Heathrow Corporate Affairs and Crisis Communication	Covers the functions of Media and PR, Public Affairs and Internal, Airport and Passenger Communication and Digital and Social Media. Will join the APOC team as and when required to support the team as an incident unfolds.





## NEWS RELATED TO DEFENCE AND SECURITY

**DEBATING DUAL-USE TECHNOLOGIES AND SMART CLUSTERING AT EU LEVEL**

More than 120 attendees gathered on 25 November 2014 in Brussels to Exchange views and offer ways forward on an important issue for the European defence industry: dual-use and smart clustering. The workshop was organised jointly by the European Commission, the European Defence Agency (EDA) and the European Association of Development Agencies (EUROADA).

Participants then had the opportunity to engage with other attendees during a networking session of pre-arranged one-on-one meetings. About 60 of those pre-arranged meetings were held.

**THREE SUCCESSIVE PANELS**

- The first one focused on the European Union's existing policies and tools to support dual-use research and clustering. To support clusters is a good breeding ground for innovative SMEs.
- The second one offered stakeholders from defence-related clusters an opportunity to share their experiences and the associated challenges. Clusters from Estonia, France, Poland and Portugal were represented. They emphasized the need for greater cooperation at EU level in order to develop their dual-use activities.
- The third one focused on ways to develop dual-use opportunities at European level and saw interventions from the ECSEL JU (Electronic Components and Systems for European Leadership Joint Undertaking), the European Commission and EDA.

Participants then had the opportunity to engage with other attendees during a networking session of pre-arranged one-on-one meetings. About 60 of those pre-arranged meetings were held.

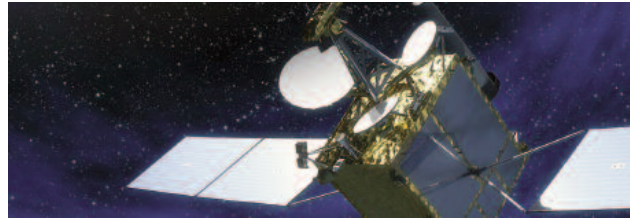
**EDA DISCUSSES SYNERGIES AT EU SPACE POLICY CONFERENCE**

The 7th Annual Conference on European Union Space Policy took place 27-28 January 2015 in Brussels. This event, which gathered high-level speakers from governments, industry and EU institutions, focused on the rising demand for space services and applications in Europe and on ways to reinforce the EU's position in that domain.

**GOVSATCOM**

Speaking as part of the 6th session dedicated to the increasing civil and security & defence synergies of space services, EDA European Synergies & Innovation Director Denis Roger put the focus on the EDA's role in the cooperative Govsatcom (Governmental Satellite Communi-

cations) programme. Pointing out that a common set of requirements had been approved by participating Member States in 2014 he said that the EDA is now preparing the technical studies that will allow to offer options to Member States by late 2016/early 2017.



This programme will need to benefit from a **dual approach**, taking into account military and civil needs.

Denis Roger also discussed the subject of Remotely Piloted Aircraft Systems (RPAS) which is another capability priority supported by the December 2013 European Council with an important space dimension.

**DUAL-USE APPROACH**

The benefits of a dual-use approach on these topics were again stressed and **Cyber Defence** was also mentioned as a field where close coordination between civil and military users is needed.

**CONCLUSION**

Denis Roger concluded on the fact that the progress made to better exploit civil-military synergies did not diminish the need for specific defence research and had to be pursued through the full use of EU funding instruments to support them as well as other dual-use initiatives in the space domain.

**THE SEMINAR "BUILDING CONSENSUS TOWARDS THE JUNE 2015 EUROPEAN COUNCIL – NEXT STEPS?"**

This high-level seminar organised in the framework of the Latvian EU Presidency on 19 January 2015, was attended by representatives from the EU ministries of defence, European institutions as well as representatives of the academic community.

**THE OPENING SPEECH BY LATVIAN MINISTER OF DEFENCE RAIMONDS VEJONIS**

Latvian Minister of Defence Raimonds Vējonis opened the seminar by addressing keynote speech where he emphasized the importance of working together to guarantee Europe's security and prosperity against the background of changes to the global security environment, and argued that the European Council in June 2015 presented a significant opportunity to address common threats and challenges. During his speech, Minister Vējonis outlined a review of strategic defence documents as one of Latvia's priorities for the European Council: in particular an update of the



European security Strategy should be assigned. Secondly, cooperation and coordination between EU Bodies active in the field of CSDP (Common Security and Defence Policy) should be enhanced. Minister Véjonis mentioned the four capability programmes the EDA was entrusted with as successful examples of increased cooperation:

- Air-to-Air refuelling;
- Remotely Piloted Aircraft Systems (RPAS);
- Satellite communication;
- Cyber defence.

He emphasized that the EU's comprehensive approach including cooperation between military and civilian actors should be bolstered to address hybrid threats. Finally, cyber defence and the EU's maritime security are two areas Latvia will put special emphasis on during its presidency.

#### BESIDES

The EDA participated in a panel discussion on strengthening Europe's defence industry.

Tarja Jaakkola, deputy director & Head of Unit Market and Industry policy presented the EDA's work in the fields of research and dual-use.

Further discussions included ways of enhancing the development of EU's capabilities as well as the role of the EU Common Security and Defence Policy (CSDP) in the global security environment.

#### EUROFIGHTER GLOBAL AIR POLICING DUTIES REMAIN KEY ROLE FOR 2015

Eurofighter Typhoon will continue to play a 'key role' as a deterrent and 'policing capability' for 2015, says Alberto Gutierrez, CEO of Eurofighter Jagdflugzeug GmbH.



Speaking from Eurofighter's HQ in Munich Alberto Gutierrez said:

*"Now, the role that the Eurofighter is playing in protecting nations and policing behaviours across the globe is a critical capability for our customer's armed forces."*

With 427 Eurofighter Typhoon aircraft delivered to customer air forces in six nations, this multi-role fast-jet fighter is increasingly being seen protecting skies through a variety of missions.

"Eurofighter's track record in meeting the challenges of Quick Reaction Alert duties is, I believe, second to none. It

is something we can be extremely proud of" Alberto Gutierrez declared.

#### 427 EUROFIGHTER TYPHOONS HAVE BEEN DELIVERED

The breakdown is as follows:

UK	130
Germany	110
Italy	75
Spain	52
Saudi Arabia	45
Austria	15

Besides, the process of meeting an order for 12 aircraft in addition to the 427 above mentioned is in course: customer Sultan of Oman.

<http://www.eurofighter.com/customers>

#### AIRBUS A400M MILITARY TRANSPORT

Airbus Defence and Space has formally delivered the first Airbus A400M military transport ordered by Germany. The Bundeswehr accepted the aircraft at the A400M Final Assembly Line in Seville, Spain, on 18 December 2014.



The first German A400M during its maiden flight.  
Credit Airbus Defence & Space

## ABOUT THE NEW LAUNCHER ARIANE 6

**On 2 December 2014, ESA concluded a productive one-day Council meeting at ministerial level in Luxembourg. Ministers adopted three resolutions:**

- Resolution on Europe's access to space, covering the development of Ariane 6 and Vega-C
- Resolution on Europe's space exploration strategy
- Resolution on ESA evolution.

**A short paper is presented here below, which gives in a few words an idea about the future ARIANE 6 Launcher's concept.**

### WHY IS IT NEEDED?

Market forecasts indicate increasing worldwide competition among launch service providers making it essential to develop a post-Ariane 5 ECA system as early as possible to reduce costs to more competitive levels, thus continuing to guarantee Europe's access to space.

### HOW?

At the November 2012 ESA Council meeting at Ministerial level in Naples, Italy, Ministers secured investments for detailed definition studies of the new Ariane 6 launcher and the continuation of the development of Ariane 5 ME Adapted, with the goal of developing as many commonalities as possible between the two vehicles.

Ariane 6 preparation has built on the work completed in the Future Launchers Preparatory Programme (FLPP), the activities within the Ariane 5 post-ECA programme (such as the Vinci engine), and the results of national and industrial initiatives.

Concepts handled within FLPP were gradually reduced to a number of reference launch systems after top-level mission requirements in terms of performance and cost were considered, and the required technologies and readiness levels were identified.

### ARIANE 6 OBJECTIVES AND MAIN MISSIONS

The overarching aim of Ariane 6 is to provide guaranteed access to space for Europe at a competitive price without requiring public sector support for exploitation.

Different concepts have been examined for Ariane 6 such as single- and dual-payloads, solid or cryogenic propulsion for the main stage, and the number of stages (three or more), all to cover a wide range of missions:

- GEO, either directly or through intermediate orbits, in particular GTO and LEO,
- Polar/SSO,
- MEO or MTO,
- other.

The targeted payload performance of Ariane 6 is 4.5 t for polar/Sun-synchronous orbit missions at 800 km altitude and 3–10 t, with two main segments (3.5–5 t and 6–6.5 t) in GTO-equivalent.

The exploitation cost of the Ariane 6 launch system is its key driver. The first flight is targeted for 2020.

### ARIANE 6 CONCEPTS

Configurations that maximise commonalities between the rockets' stages, and flexibility for adapting to an evolving commercial market, are considered more likely to lead to a competitive launch service price.

Ariane 6 is a modular three-stage launcher (solid–cryogenic–cryogenic) with two configurations using: four boosters (A64) or two boosters (A62).

This is based on:

- A main stage containing liquid oxygen and hydrogen based on the Vulcain engine of Ariane 5 ECA and ME;
- Two or four P120 solid rocket boosters, which will be common with Vega-C (an evolution of the current Vega launcher);



Artist's view of the Ariane 6 configuration using four boosters (A64)



– A cryogenic upper stage (LOX/LH2) propelled by a Vinci engine, based on the A5ME upper stage, with limited adaptations.

Ariane 6 in its A62 or A64 configuration is deemed the best possible long-term solution to maintain competences in Europe and deliver launch services against competitive costs.

Ariane 6 will have reignition capability and will be capable of performing a direct deorbiting and controlled reentry of the upper stage.

Flexibility is a design characteristic for A64 and A62. In essence it is the same launcher, responding to different market needs by varying the number of boosters in the configuration.

The A62, with two P120 solid boosters, will be used mainly in single-launch configurations, while the A64 – with four P120 solids – will enable double launch of medium-class satellites up to 4.5–5 t, mainly for commercial market needs.

The main characteristics of the Ariane 6 concept are:

- The total length of the vehicle is around 63 m,
- The loading of the cryogenic main stage is about 149 tonnes of propellants,
- The external diameter of the cryogenic main stage is about 4.6 m.

### ARIANE 6 WAY FORWARD

To streamline the industrial organisation, reduce the number of interfaces and thus reduce the costs and risks to be borne by Member States in development and exploitation, Airbus Space & Defence and Safran, the two largest European industrial actors in launchers, have created a joint venture to lead the development and production of the future European launch system.

In response to the resulting industrial proposal, major stakeholders from Member States and industry have been working together to respond to the objectives set by Ministers and by Council. The result is a joint ESA–industry proposal for Ariane 6.

## THE CREATION OF AIRBUS SAFRAN LAUNCHERS

**On 3 December 2014, AIRBUS Group and SAFRAN have announced the creation of their new Joint Venture named Airbus SAFRAN Launchers.**

Airbus Group and Safran welcomed on 2 December 2014 the approval by the ESA ministerial Conference for the development and production of the new Ariane 6 launcher. Both companies had made a far-reaching industrial proposal for Ariane 6 and its endorsement had been critical for the Joint venture's creation.

Tom Enders, CEO of Airbus Group declared:

*“With this Joint Venture, industry has made a strong statement and has assumed leadership to foster Europe’s autonomous access to space. Yesterday’s ESA Ministerial Conference will be remembered as the one that decided upon a new Ariane launcher family for the next decades and opened a new a new chapter in the way Europe conducts and manages its space ambitions. If we want to successfully counter growing international competition and prevent the risk of Europe’s space sector from being marginalized, a lot more has to be done. Therefore, we hope that this ESA Ministerial Conference serves as a catalyst to transform the way institutional space agencies operate and interface with industry in the future.”*

Jean-Paul Herteman, Chairman and CEO of Safran said:

*“The creation of Airbus Safran Launchers immediately after the Ministerial Conference is much more than a symbol; It is a sign of our strong engagement and our ability to deploy our resources and meet our commitments. This is precisely what we will continue to do to ensure that all stakeholders –*

*industry and European States – are able to pursue the remarkable success of the Ariane programme and continue to guarantee independent, reliable and competitive access to space for Europe. I strongly believe Airbus Safran Launchers will be a major worldwide player in the launcher domain, poised to capture market growth and better serve institutional as well as commercial customers. Indeed, Europe has all it needs to be in a pole position in the race for technologies, which will be, as in the past, highly beneficial for the whole aerospace industry.”*

Tom Enders and Jean-Paul Herteman thanked the teams at Airbus Group and Safran who over the last months had prepared the establishment of the new JV in record time. With the support of customers and shareholders, most regulatory approvals and consultations such as those from the competition authorities, Arianespace and the two Groups’ works Councils have been completed for the transaction. Closing took place on 31 December 2014 after completion of final formalities.

This signature launches the first phase of the transaction. In a second phase, all activities of Airbus Group and Safran dealing with space launchers will be integrated in the Joint Venture.

With an initial workforce of around 450 persons, Airbus Safran Launchers JV started operations on 1 January 2015, working on the new family of state-of-the-art space launchers. The new company brings together the expertise of both Airbus Group and Safran in space launchers at key Franco-German industrial sites. The JV’s headquarters is located in Issy-les-Moulineaux, near Paris.

## AMONG LATEST NEWS CONCERNING GALILEO

### GALILEO'S FIFTH SATELLITE PERFORMS ITS FIRST NAVIGATION FIX

In August 2014, the two first 'Full Operational Capability' satellites –Galileo 5 and Galileo 6 - coming after the four In-Orbit Validation satellites – were delivered in a wrong orbit: elongated orbit 25 900 km – 13 713 km instead of a circular path at 23 222 km, and also wrong angle of the orbit to the equator.

GALILEO'S FIFTH SATELLITE – SALVAGED IN DECEMBER 2014 FROM THE WRONG ORBIT TO BEGIN NAVIGATION TESTING – HAS BEEN COMBINED WITH THREE PREDECESSORS (IN-ORBIT VALIDATION) TO PROVIDE ITS VERY FIRST POSITION FIX.

Test receivers at ESA/ESTEC and at the Galileo In-Orbit Test Station at Redu (Belgium) received the signals at 12:48 GMT on 9 December from the quartet of satellites and fixed their horizontal positions to better than 2 m.

This achievement is particularly significant because the fifth satellite is the first of a new design of 22 Galileo satellites set to be launched over the next few years.

Further position fixes were then made by CNES (France, Toulouse Centre). The following days, fixes were performed

using Galileo's public regulated Service, the encrypted highest-precision class of signal.

This was a significant milestone for the Galileo programme because it was the first time that a 'Full Operational Capability (FOC)' satellite had performed a fix together with its 'In-Orbit Validation' predecessors which had been launched in 2011 and 2012. In particular it opens the door to the immediate use of this fifth satellite in combination with additional navigation message information provided through ground networks, which is a standard mode such as those found in our smart phones.

A similar salvage operation is planned for the Sixth satellite. [http://www.esa.int/our\\_Activities/Navigation/Salvaged\\_Galileo\\_performs](http://www.esa.int/our_Activities/Navigation/Salvaged_Galileo_performs)

### FOUR GALILEO SATELLITES AT ESA TEST CENTRE

Production of further 'FOC' satellites continues steadily. Following on from the first 'IOV' satellites, 22 of these FOC satellites are being built by OHB in Bremen (Germany) with navigation payloads from SSTL in Guildford (UK).

Four FOC satellites are presently completing tests at ESA/ESTEC are designated as follows: FM 03 – 04 – 05 – 06. (FM = Flight Model)

## ABOUT COPERNICUS

### FIRST COPERNICUS SATELLITE IS OPERATIONAL SINCE OCTOBER 2014



Handing over Sentinel 1-A. Project Manager Ramon Torres, who led the development team, formally handed over the satellite to the mission Manager, Pierre Potin. Credit ESA

Launched on 3 April 2014, Sentinel 1-A completed commissioning on 23 September 2014, an important process ensuring the satellite, instruments, data acquisition and data processing procedures are working well. Not only did Sentinel 1-A pass these tests and reach its target orbit on 7 August, eight anti-collision manoeuvres to avoid space debris were performed during this phase.

6 October 2014: with the commissioning of Sentinel 1-A completed and the satellites transfer to the team in charge of its exploitation, its data are available as of this date to all users. This marks the beginning of the satellite's operational life, delivering radar coverage for an array of applications in the area of oceans, ice, changing land and emergency response.

Sentinel 1-A is a two-satellite constellation providing an all-weather, day-and-night supply of imagery of Earth's surface. During the commissioning phase, it demonstrated its potential in various application domains.

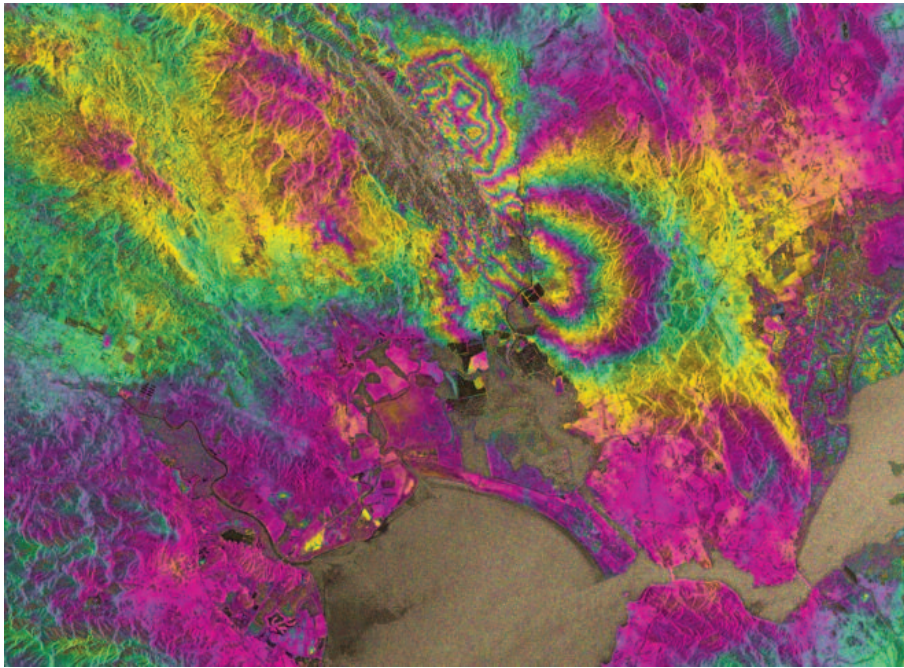
Just days after launch, its results were included in maps of the floods that hit Namibia as well as those in the Balkans one month later.

Radar images were used to map the rupture caused by 24 August earthquake that shook northern California.

The towing of the Costa Concordia cruise ship off the west coast of Italy was captured by the radar.

Many services will benefit from Sentinel 1-A: monitoring Arctic sea-ice mapping, routine sea-ice mapping, surveillance of marine environment, monitoring land-surface for motion risks, mapping for forest, water and soil management, mapping to support humanitarian aid and crisis situation assessment.





Napa Valley quake. Credit ESA

### Napa Valley quake

Description The biggest earthquake in 25 years struck California's Napa Valley in the early hours of 24 August 2014. By processing two Sentinel-1A images, which were acquired on 7 August and 31 August 2014 over this wine-producing region, an interferogram was generated. The two round shapes around Napa valley, which are visible in the central part of the image show how the ground moved during the quake. Deformation on the ground causes phase changes in radar signals that appear as the rainbow-coloured patterns. Each colour cycle corresponds to a deformation of 28 mm deformation. The maximum deformation is more than 10 cm, and an area of about 30x30 km was affected significantly.

Interferograms like these are being used by scientists on the ground to help them map the surface rupture and model the earthquake. This interferogram very clearly shows the fault that caused the earthquake, which had not been identified as being particularly hazardous prior to the event.

Despite this interferogram being computed with images acquired in the satellite's 'stripmap mode', which is not going to be the default mode when operational, this result demonstrates the capability of Sentinel-1A and marks the beginning of a new era for our ability to map earthquakes from space.

The mission's contribution will further improve once the **Sentinel 1-B** – the 1-A identical twin – is launched in **2016**.

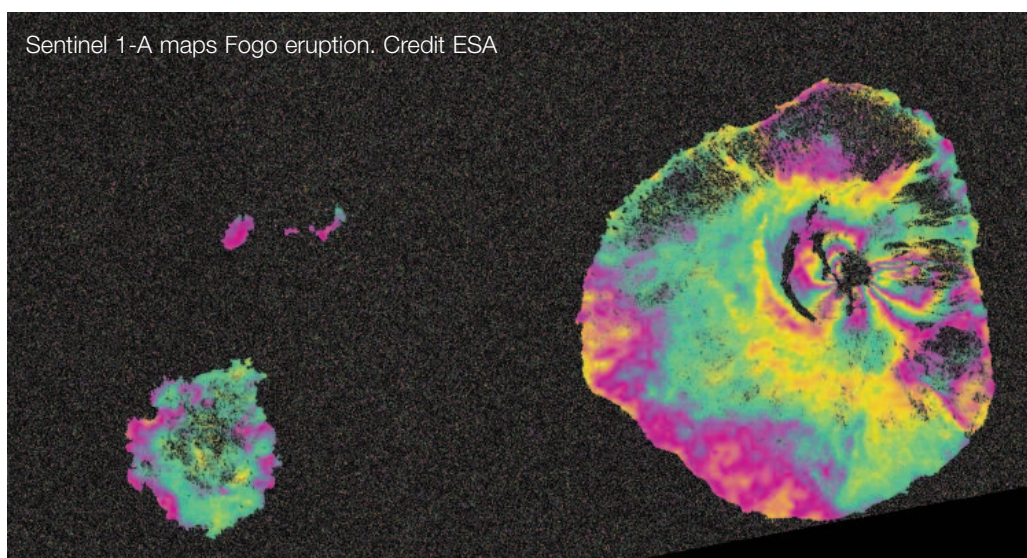
### AMONG THE LATEST SENTINEL-1A TRANSMITTED DATA FOGO VOLCANO ON SENTINEL'S RADAR

2 December 2014: Radar images from the Sentinel-1A satellite are helping to monitor ground movements of the recently erupted Fogo volcano.

Located on Cape Verde's Fogo Island, the volcano erupted on 23 November 2014 for the first time in 19 years and has been active ever since. Lava flows are threatening nearby villages, and local residents have been evacuated.

The image is an 'interferogram': a combination of two radar images from 3 November and 27 November 2014, before and during the eruption. Deformation on the ground causes changes in radar signals that appear as the rainbow-coloured patterns. Scientists can use the deformation patterns to understand the subsurface pathways of molten rock moving towards the surface. In this case, the radar shows that the magma travelled along a crack at least 1 km wide.

### DLR AND ESA SIGN THE COLLABORATIVE GROUND SEGMENT COOPERATION FOR SENTINEL-1 DATA



Sentinel 1-A maps Fogo eruption. Credit ESA

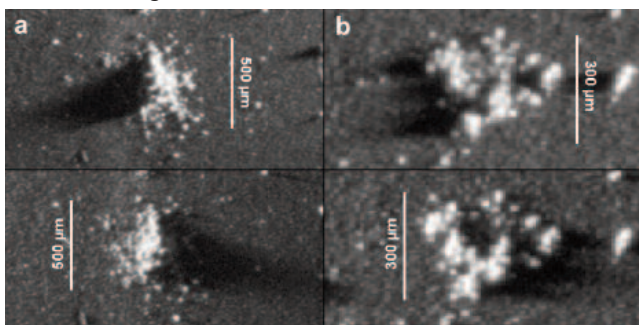


## ROSETTA MISSION: AMONG LATEST NEWS

### ROSETTA WATCHES COMET SHED ITS DUSTY COAT

On 26 January 2015, Rosetta was providing unique insight into the life cycle of comet's dusty surface, watching 67P/Churyumov-Gerasimenko as it sheds the dusty coat it has accumulated over the past 4 years.

The COmetary Secondary Ion Mass Analyser 'COSIMA' started collecting, imaging and measuring the composition of dust particles shortly after the spacecraft arrives at the comet in August 2014.



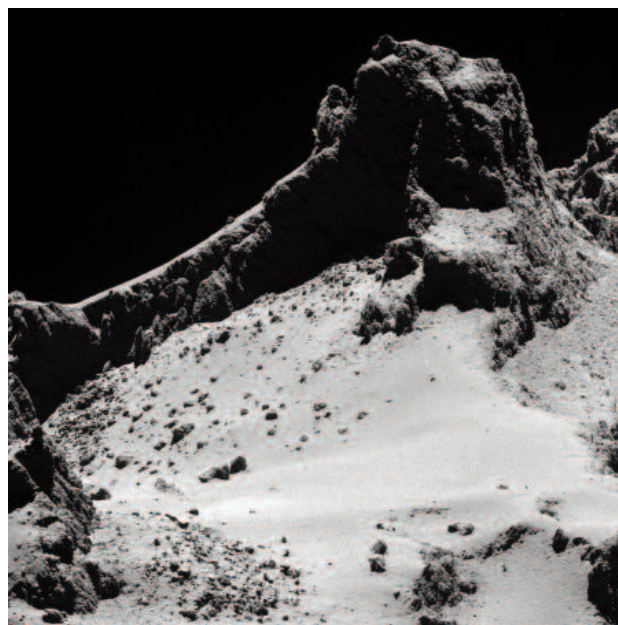
Two examples of dust grains collected by COSIMA in the period 25-31 October 2014. Both grains were collected at a distance of 10-20 km from the comet nucleus. Image (a) shows a dust particle that crumbled into a rubble pile when collected; (b) shows a dust particle that shattered.

Credit ESA/Rosetta/MPS

### PLUFFY DUST GRAINS GETTING TO KNOW ROSETTA'S COMET

On 22 January 2015, Rosetta was revealing 67/P comet as having a remarkable array of surface features and with many processes contributing to its activity, painting a complex picture of its evolution.

The familiar shape of the dual-lobed comet has now had many of its vital statistics measured: the small lobe measures 2.6 x 2.3 x 1.8 km and the large lobe 4.1 x 3.3 x 1.8



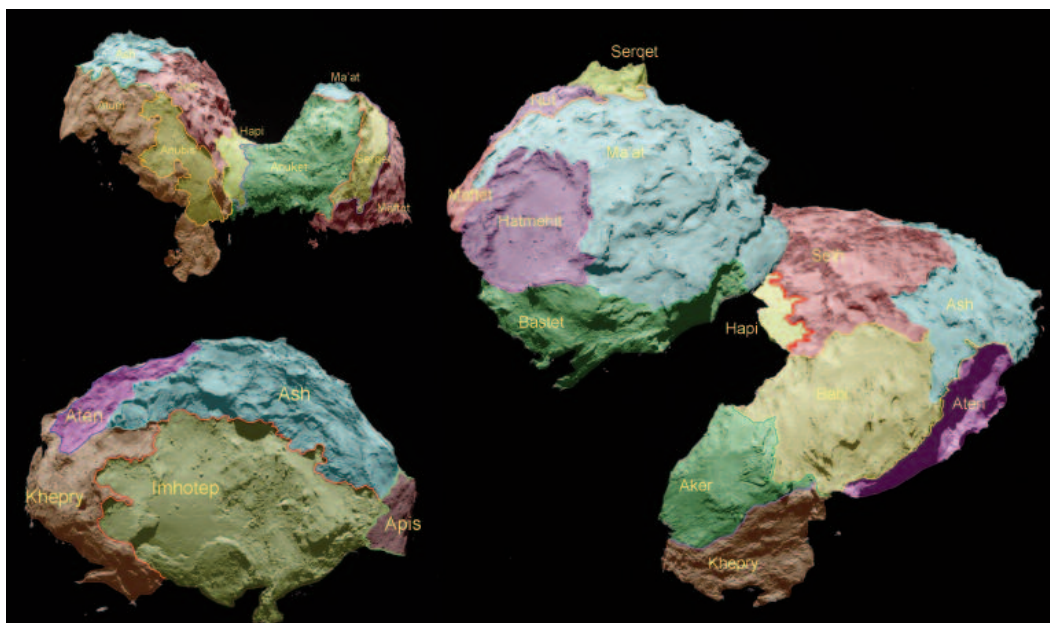
Comet from 8 km

Released 22/01/2015 08:00 pm. A section of the smaller of Comet two lobes as seen through Rosetta's narrow-angle camera from a distance of about 8 km to the surface on 14 October 2014. Resolution = 15 cm/pixel.

Credit: ESA/rosetta/MPS for OSIRIS Team MPS/UPD/LAM/IAA/SSO/INTA/UPM/DASP/IDA

km. The total volume of the comet is 21.4 km<sup>3</sup> and the radio Science Instrument has measured its mass to be 10 billion tonnes, yielding a density of 470 kg/m<sup>3</sup>.

By assuming an overall composition dominated by water ice and dust with a density of 1500-2000 kg/m<sup>3</sup> the Rosetta scientists show that the comet has a very high porosity of 70-80%, with the interior structure likely comprising weakly bonded ice-dust clumps with small void spaces between them.



Comet regional maps  
Credit ESA/Rosetta

## YEAR 2015

02-06 March • **ESA** – 8<sup>th</sup> ESASV – Symposium on Aerothermodynamics for Space Vehicles – Lisbon (Portugal) – [www.congrexprojects.com/15a01](http://www.congrexprojects.com/15a01)

10-12 March • **CANSO** – World ATM Congress 2015 – Madrid (Spain) – [www.canso.org/worldatmcongress](http://www.canso.org/worldatmcongress)

17 March • **Cleansky JU** – CLEANSKY FORUM – Cleansky 2 Info Day – Brussels (Belgium) – [www.cleanskyju.eu](http://www.cleanskyju.eu)

17-18 March • **RAeS** – The Flight Operations Manager in the 21<sup>st</sup> Century – London (UK) – [www.aerosociety.com/Events](http://www.aerosociety.com/Events)

18-20 March • **ICAO** – Making Civil Space a REALITY – Montréal (Canada) – ICAO/HQ – [www.icao.int/meetings/space2015/](http://www.icao.int/meetings/space2015/)

23-26 March • **Euroturbo** – 11<sup>th</sup> European Turbomachinery Conference – Madrid (Spain) – [www.euroturbo.eu/](http://www.euroturbo.eu/)

23-27 March • **ESA** – FRINGE 2015 – Scientific Exploitation of Operational Missions – Workshop – Frascati, ESA/ESRIN (Italy) – [www.seom.esa.int/fringe2015/](http://www.seom.esa.int/fringe2015/)

25-26 March • **BavAIRia** – Aviation Electronics Europe – Munich (Germany) – MOC Event Centre – [www.ae-expo.eu](http://www.ae-expo.eu)

25-27 March • **ASTech** – 6<sup>th</sup> International Conference on Fatigue of Composites – Musée de l'Air et de l'Espace – Paris (France) – [www.pole-astech.org](http://www.pole-astech.org)

29 March-01 April • **3AF** – 50<sup>th</sup> 3AF Conference on Applied Aerodynamics – Forthcoming Challenges for Aerodynamics – Toulouse (France) – [www.3af-aerodynamics2015.com](http://www.3af-aerodynamics2015.com)

13-15 April • **CEAS – EuroGNC 2015** – 3<sup>rd</sup> CEAS Specialist Conference on Guidance, Navigation and Control (GNC) – Toulouse (France) – [www.onera.fr/eurognc2015](http://www.onera.fr/eurognc2015)

13-17 April • **IAA** – 2015 IAA Planetary Defense Conference – Frascati (Italy) – ESA/ESRIN – [www.pdc2015.org](http://www.pdc2015.org)

15-16 April • **Numeca International** – UMRIDA workshop on uncertainty Quantification – Delft (NL) – TU Delft – [www.umrida.eu](http://www.umrida.eu)

15-18 April • **AERO** – AERO Friedrichshafen 2015 – General aviation – Friedrichshafen (Germany) – [www.aero-expo.com/](http://www.aero-expo.com/)

21-23 April • **ACI Europe** – 24<sup>th</sup> Airport Commercial & Retail Conference and Exhibition – Prague (Czech Republic) – Nhow Milano Hotel – [www.aci-europe-events.com](http://www.aci-europe-events.com)

5-7 May • **IATA** – 2015 Cabin Operations Safety Conference – Paris (France) – Le Méridien Etoile – [www.iata.org/events/](http://www.iata.org/events/)

11-13 May • **ESA** – ASTRA 2015 – 13<sup>th</sup> Symposium on Advanced Space Technologies in Robotics and Automation – Noordwijk (NL) – ESA/ESTEC – [www.congrexprojects.com/2015-events/15a07/](http://www.congrexprojects.com/2015-events/15a07/)

12 May • **RAeS** – Human Factors in Engineering – The next generation -Engineering Innovation Day 2015 – Cranfield (UK) – Cranfield University Vincent Building Auditorium – [www.aerosociety.com/Events/](http://www.aerosociety.com/Events/)

18-20 May • **ESA** – TRISMAC 2015 – Frascati (Italy) – ESA/ESRIN – [www.congrexprojects.com/2015-events/trismac2015/general](http://www.congrexprojects.com/2015-events/trismac2015/general)

18-22 May • **ESA/CNES** – 2<sup>nd</sup> SMOS Science Conference - Soil Moisture Ocean Salinity satellite data applications – Madrid (Spain) – ESA/ESAC – [www.smos2015.info/](http://www.smos2015.info/)

19-21 May • **EBAA/NBAA – EBACE 2015** – Geneva (Switzerland) – Palexpo Geneva International Airport – [www.ebace.aero/](http://www.ebace.aero/)

25-27 May • **22<sup>nd</sup> St-Petersburg International Conference on Integrated Navigation Systems** – Saint-Petersburg (Russia) – [www.Elektropribor.spb.ru](http://www.Elektropribor.spb.ru)

02-03 June • **RAeS – Delivering Weapon Systems Effects Contrast piloted/remotely-piloted platforms** - Malvern (UK) – QinetiQ Malvern Technology Centre – St Andrews Rd – [www.aerosociety.com/Events](http://www.aerosociety.com/Events)

02-03 June • **EUROCONTROL/ERA – Forum** – Safety and Automation in Aviation – Brussels (Belgium) – EUROCONTROL/HQ – [www.skybrary.aero/index.php/Portal:Automation\\_and\\_Safety](http://www.skybrary.aero/index.php/Portal:Automation_and_Safety)

02-05 June • **ESA – Sentinel-3 for Science Workshop** – Venice (Italy) – Palazzo del Casino – Lido – [www.seom.esa.int/S3forScience2015/](http://www.seom.esa.int/S3forScience2015/)

07-12 June • **ESA/ANDOYA SPACE CENTRE – 22<sup>nd</sup> ESA Symposium on Rocket and Balloon Programme** – Tromso (Norway) – [www.pac.spaceflight.esa.int](http://www.pac.spaceflight.esa.int)

8-10 June • **ESA – XMM-Newton 2015 Science Workshop** – Madrid (Spain) – ESA/ESAC – [www.xmm.esac.esa.int/](http://www.xmm.esac.esa.int/)

09-10 June • **NATO/EUROCONTROL – NEASCOG/37 : ATM Security Conference, Workshop and Exhibition** – Brussels (Belgium) – EUROCONTROL/HQ – [www.eurocontrol.int/neascog-37](http://www.eurocontrol.int/neascog-37)

09-10 June • **RAeS – Future Challenges in Flight Simulation** – London (UK) – RAeS/HQ – [www.aerosociety.com/Events](http://www.aerosociety.com/Events)

09-11 June • **3AF/SEE – ETTC 2015** – Toulouse (France) – Centre de Conférences Pierre Baudis – [www.ettc2015.org](http://www.ettc2015.org)

09-12 June • **3AF – 11<sup>th</sup> International Conference on Missile Defence** – Barcelona (Spain) – Palay de Congressos de Catalunya – [www.missile-defence.com](http://www.missile-defence.com) - [www.3af.fr](http://www.3af.fr)

10-12 June • **EASA/FAA – EASA/FAA International Aviation Safety Conference** – Brussels (Belgium) – [www.easa.europa.eu](http://www.easa.europa.eu)

15-19 June • **ESA – 12<sup>th</sup> International Planetary Probe Workshop (IPPW-12)** – Cologne (Germany) – Hyatt Regency – [www.planetaryprobe.eu/](http://www.planetaryprobe.eu/)

15-21 June • **SIAE/GIFAS– International Paris Air Show 2015** – Le Bourget (France) – [www.siae.fr/](http://www.siae.fr/)

16-17 June • **ESA – European Ground System Architecture Workshop (ESAW)** – Darmstadt (Germany) – ESA/ESOC – [www.congrexprojects.com/2015-events/15a06/introduction](http://www.congrexprojects.com/2015-events/15a06/introduction)

16-19 June • **AIAA – 7<sup>th</sup> International Conference on Recent Advances in Space Technologies** – RAST 2015 – Istanbul (Turkey) – [www.rast.org.tr](http://www.rast.org.tr)

22-25 June • **SAE International** – International Conference on Icing of Aircraft, Engines and Structures – Prague (Czech Republic) – Hotel International Prague – [www.sae.org/events/icing/](http://www.sae.org/events/icing/)

24-25 June • **ACI Europe – 25<sup>th</sup> ACI Europe General Assembly** – Prague (Czech Republic) – Hilton Prague [www.aci-europe-events.com](http://www.aci-europe-events.com)

28 June-2 July • **TsAGI/CEAS/AIAA – IFASD 2015** – 16th International Forum on Aeroelasticity and Structural Dynamics – Saint Petersburg (Russia) – Solo Sokos Hotel Palace Bridge – [www.ifasd2015.com/](http://www.ifasd2015.com/)

## YEAR 2015

29-30 June • **ERCOFTAC** – 11<sup>th</sup> Conference on Synthetic Turbulence Models – Lyon (France) – ECL Ecully  
[www.ercoftac.org/](http://www.ercoftac.org/)

29 June-3 July • **EUCASS** – EUCASS 2015 – Krakow (Poland) – [www.eucass2015.eu/](http://www.eucass2015.eu/)

01-04 Sept. • **ERF 2015 – DGLR/CEAS** – Munich (Germany) – [www.erf2015.de](http://www.erf2015.de) [www.erf2015.dglr.de](http://www.erf2015.dglr.de)

07-09 Sept. • **ECCOMAS** – 5<sup>th</sup> ECCOMAS Conference on Mechanical Response of Composites – Bristol (UK)  
[www.bristol.ac.uk/composites/](http://www.bristol.ac.uk/composites/)

07-11 September • **CEAS – CEAS 2015 Conference** – Delft (NL) – [www.ceas2015.org](http://www.ceas2015.org)

16 Sept. • **RAeS** – Conference Future Trends in Certification of Advanced Technology Structures – Bristol (UK) – National Composites Centre – Bristol & Bath Science Park – [www.aerosociety.com/Events](http://www.aerosociety.com/Events)

22-25 Sept. • **3AF/AIAA** – ANERS 2015 – Aircraft Noise and Emissions Reduction Symposium – La Rochelle (France)  
[www.3af.fr](http://www.3af.fr)

23-24 Sept. • **RAeS** – Conference Flight Crew Instruction, Selection, Skills & Supply – London (UK) - RAeS/HQ  
[www.aerosociety.com/Events](http://www.aerosociety.com/Events)

23-24 Sept. • **3AF/AIAA/CEAS** – X-Noise/CEAS Workshop - La Rochelle (France) – [www.3af.fr](http://www.3af.fr)

07-08 October • **RAeS** – President's Conference 2015 – UAS + Detect & Avoid workshop – London (UK) - RAeS/HQ  
[www.aerosociety.com/Events](http://www.aerosociety.com/Events)

12-16 October • **IAF** – IAC 2015 – 66<sup>th</sup> International Astronautical Congress - Jerusalem (Israel) – Congress Centre  
[www.iac2015.org/](http://www.iac2015.org/)

13-14 October • **Aviation Week** – MRO Europe 2015 Conference and Exhibition – London (UK) – Excel London  
[www.mroeuropa.aviationweek.com/euro15/public/](http://www.mroeuropa.aviationweek.com/euro15/public/)

20-23 October • **EC – AERODAYS 2015** – “Aviation in Europe – Innovating for Growth” : the 7<sup>th</sup> edition of the Aeronautics Days, the flagship event in Europe for Aviation R&TD - London (UK)  
[www.adsfarnborough.co.uk/aerodays-2015/](http://www.adsfarnborough.co.uk/aerodays-2015/) [www.aerodays2015.com](http://www.aerodays2015.com)

23 October • **RAeS** – Greener by Design Conference – London (UK) - RAeS/HQ – [www.aerosociety.com/Events](http://www.aerosociety.com/Events)

11-12 November • **RAeS** – Flight Simulation Conference – London (UK) - RAeS/HQ – [www.aerosociety.com/Events](http://www.aerosociety.com/Events)

25-27 November • **ASTech** – 1<sup>st</sup> Metallic Materials and Processes Industrial Challenges – Deauville (France) –  
[www.pole-astech.org](http://www.pole-astech.org)



## THE CEAS/ASD AEROSPACE EVENTS CALENDAR

The CEAS and ASD have created an innovative tool so-called "CPMIS" (Conference Programming Management Information System), the aim of which is to facilitate the search of the different aerospace events in the world that are programmed at short and mid-term time horizon, and so allowing to optimise the scheduling of future events by avoiding possible overlapping and redundancies, but on the contrary to encourage co-operations and synergies between the actors concerned. Its role is therefore double: information on the one hand, conference programming enabler on the other.

THE ADDRESS IS: <http://www.aerospace-events.eu>

A search engine selects the events according to specific topics and key words. A graphic display (day, week and months view) eases the access and the view.

- 4 TYPES: Conference, Workshop, Lecture, Air Show
- 6 MAIN CATEGORIES: Aeronautical sciences - Aerospace (for events including all aspects of aviation and space) - Civil Aviation - Air power - Space - Students and Young Professionals.
- 64 SUB - CATEGORIES: aeroacoustics - aeroelasticity - aerodynamics, etc.

### AUTOMATIC INSERTION OF NEW EVENTS BY THE ORGANISERS THEMSELVES:

- Go to <http://www.aerospace-events.eu>
- Click on the "introduction" text
- Redirected on the New Event Form, you have to click on this form and to enter your event related information, validate, click on Save and send.

### CONTACTS:

[postmaster@aerospace-events.eu](mailto:postmaster@aerospace-events.eu) is the general address for any question and requests;

- Marc de Champs, responsible for the CPMIS computerized tool management at ASD (AeroSpace and Defence industry associations of Europe):

[marc.dechamps@asd.europe.org](mailto:marc.dechamps@asd.europe.org)

- Jean-Pierre Sanfourche, CEAS, responsible for the Events Calendar permanent updating and validation:

[jpsanfourche@dbmail.com](mailto:jpsanfourche@dbmail.com)

The poster for the 41st European Rotorcraft Forum 2015 features a central image of a white EC135T3 helicopter in flight against a mountainous landscape. The top section has a blue background with the ERF logo and the text "41st European Rotorcraft Forum 2015". Below the image, it states "September 1 - 4, 2015 Munich, Germany". The bottom section has a white background with the text "CALL FOR PAPERS" and logos for DGLR and CEAS.



# London, 20 – 23 October 2015

*"A perfect place to see what European research and innovation efforts can accomplish and to stimulate cross-border working to find innovative ways for Europe to remain a global player"*

Maire Geoghegan-Quinn, EU Commissioner for Research and Innovation (Madrid, 2011)

## What is Aerodays?

Aerodays is the European flagship event in Aviation research and innovation taking place once during each EU Research Framework Programme.

Designed to present strategic perspectives for Aviation, including research and innovation. The goal is to share achievements of collaborative research and innovation in Aeronautics and Air Transport within Europe and in world-wide international co-operation.

## Who takes part?

The last Aerodays 2011 in Madrid welcomed over 1400 delegates including government officials, key decision makers from industry, researchers, engineers, academics, students and journalists.

## Conference themes for 2015

Throughout the four day event, there will be 4 key themes addressed resulting from Europe's Vision for Aviation 'Flightpath 2050':

- **Greening of aviation** - if carbon emissions continue to rise, they could contribute up to 15% of global warming within 50 years. The industry needs to deliver technology solutions at an increasing rate to mitigate the impact
- **Competitiveness of industry** - innovation and technological leadership is the competitive differentiator for European industry. With emerging players vying for market share, technology that optimises energy use and maximises efficiency, quality and reliability will be the keys to success
- **Efficient and seamless mobility** - aviation is key to connectivity through transport; adding value through business and the general public. Aviation technologies will help ensure the sector is an integral, seamless node for the future
- **Breakthrough innovations** - the potential of zero-carbon flight has



been demonstrated. Autonomy has potential for safety and efficiency. Smart materials are yet to be produced on an industrial scale. These and other exciting breakthroughs need to be discovered and adopted to enable future generations to fly.

## Some good reasons why you should be at Aerodays 2015!

- It's a forum for senior policy-makers and researchers to debate and discuss
- It's a platform for the sharing outputs from world-leading technology programmes
- Get a comprehensive overview on technological developments in aviation
- Take part in networking and social forums to increase connections and interaction within the aviation sector
- Learn in a master class programme on partnering and collaborating in EC consortia
- It's a place to incentivise and motivate young scientists and engineers
- There's the opportunity for school children to engage with aviation technology and developments

For information and to register interest visit: [www.aerodays2015.com](http://www.aerodays2015.com)

