



The Quarterly  
Bulletin of the

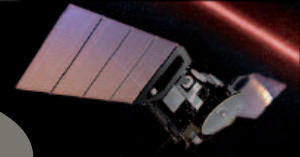
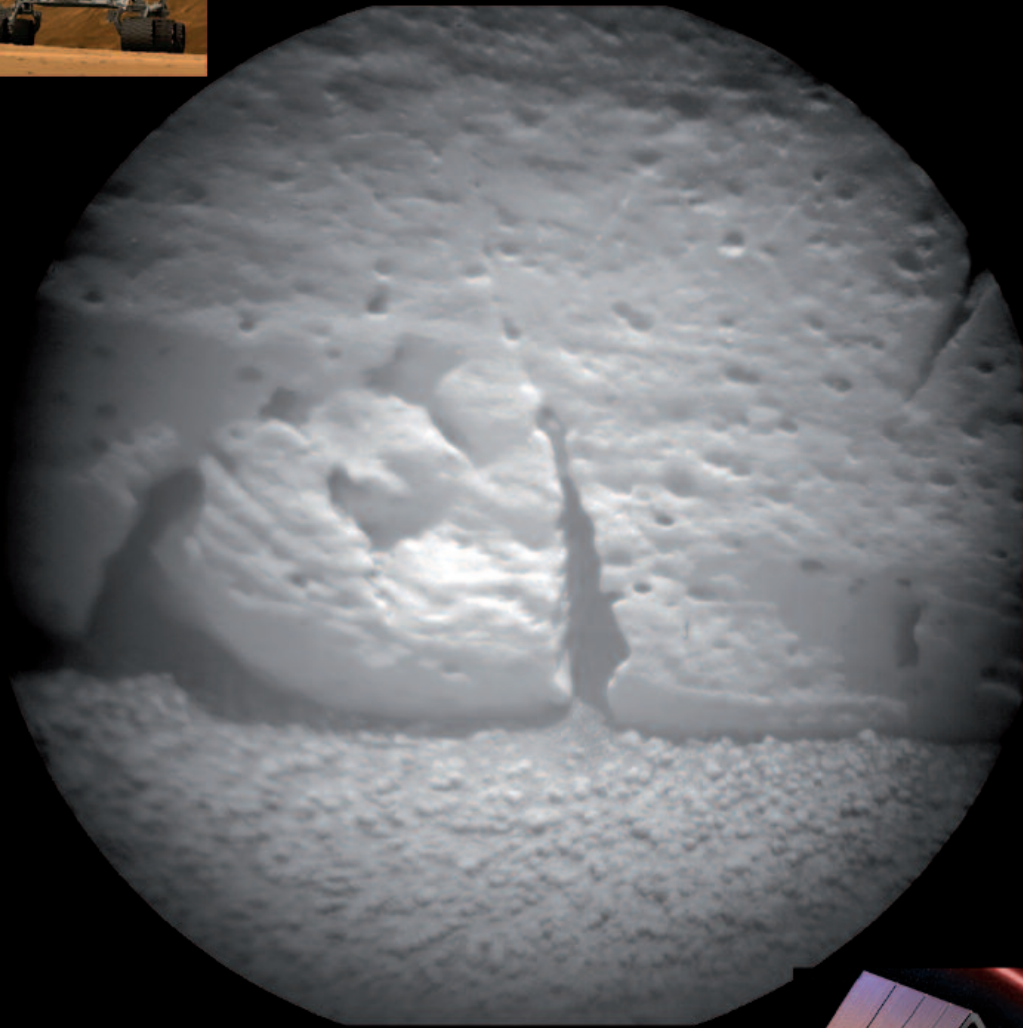
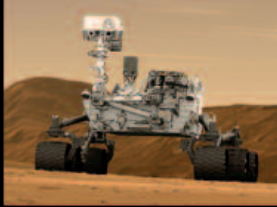
# CEAS

COUNCIL OF EUROPEAN AEROSPACE SOCIETIES

3AF-AIAE-AIDAA-CzAeS -DGLR-FTF-HAES-NVvL-PSAA-RAAA-RAeS-SVFW-TsAGI-VKI



Issue 4 - 2012  
December



ESA-NASA COOPERATION ON MARS IS A CONTINUING

SUCCESS: – THE MOST RECENT EXAMPLE IS DATED

26 NOVEMBER 2012, WHEN FOR THE FIRST TIME, THE ESA'S MARS EXPRESS

ORBITER RELAYED SCIENTIFIC DATA FROM NASA'S CURIOSITY ROVER

ON THE RED PLANET'S SURFACE.

CEAS

## 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 15 Member Societies: 3AF (France), AIAE (Spain), AIDAA (Italy), CzAeS (Czech Republic), DGLR (Germany), FTF (Sweden), HAES (Greece), NVvL (Netherlands), PSAS (Poland), RAAA (Romania), RAeS (United Kingdom), SVFW (Switzerland), TsAGI (Russia), VKI (Von Karman Institute, Belgium) and EUROAVIA.

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

## 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

### 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.

### THE OFFICERS OF THE BOARD IN 2013:

President: **David Marshall**  
marshall.daavid@yahoo.com

Vice-President, Finance: **Paul Bailey**  
paul.bailey@aerosociety.com

Vice-President, Publications and External Relations: **Pierre Bescond**  
pierre.bescond@laposte.net

Vice-President, Awards and Membership: **Kaj Lundahl**  
klundahl@bredband.net

Director General (including Financial Management): **Mercedes Oliver Herrero**  
mercedes.oliver@military.airbus.com

Chairman of the Aeronautics Branch: **Christophe Hermans**  
Christophe.Hermans@dnw.aero

Chairman of the Space Branch: **Constantinos Stavriniadis**  
constantinos.stavriniadis@esa.int

Chairman of the Programme Coordination Committee: **Pierre Bescond**  
pierre.bescond@laposte.net

Editor-in-Chief of the CEAS Quarterly Bulletin: **Jean-Pierre Sanfourche**  
jpsanfourche@dbmail.com

Quarterly Bulletin, Design & Page Setting  
**Sophie Bougnon**  
sophie.bougnon1@sfr.fr

## THE CEAS MEMBER SOCIETIES

**Association Aéronautique et Astronautique de France (3AF)**

6,rue Galilée – F-75016 Paris  
 Tel.: + 33(0) 1 56 64 12 30  
 3af@aaaf.asso.fr – www.aaaf.asso.fr  
**President:** Michel Scheller  
**General Delegate:** Jacques Sauvaget  
 jacques.sauvaget@aaaf.asso.fr  
**Secretary General:** Gilles Marcoïn  
**CEAS Trustees:** Pierre Bescond  
 (CEAS President, 2011)  
 pierre.bescond@laposte.net  
 and François Gayet  
 gayet.transitions@orange.fr  
**Executive Secretary:** Anne Venables  
 secr.exec@aaaf.asso.fr  
**Event Coordination:** Lisa Gabaldi  
 lisa.gabaldi@aaaf.asso.fr  
 Sophie Videment  
 sophie.videment@aaaf.asso.fr

**Asociación de Ingenieros Aeronáuticos de España (AIAE)**

COIAE. Francisco Silvela 71, Entreplanta  
 28250 Madrid (Spain)  
 Tel.: + 34 91 745 30 30  
 CEAS@coiae.es - www.coiae.es  
**President:** Mr Felipe Navio Berzosa  
 fnavio@coiae.es  
**Vice-President:** Mrs Mercedes Oliver-Herrero  
 Mercedes.Oliver@military.airbus.com  
**CEAS Trustees:**  
 Mrs Mercedes Oliver-Herrero  
 Dr Leandro B. Fernández Sáinz  
 lfernandezs@coiae.es  
 lfernandezsainz@gmail.com  
**Secretary:** info@coiae.es

**Associazione Italiana di Aeronautica e Astronautica (AIDAA)**

Casella Postale 227 – I-00187 Roma V.R.  
 Tel / Fax : + 39 06 883 46 460  
 info@aidaa.it – www.aidaa.it  
**President:** Prof. Franco Persiani  
 franco.persiani@unibo.it  
**Secretary General:** Daniela Vinazza  
 daniela@aidaa.it  
**CEAS Trustees:**  
 Prof. Franco Persiani - Università di Bologna  
 Via Fontanelle 40  
 I - 47 121 Forlì  
 Prof. Amalia Ercoli Finzi  
 Politecnico di Milano – Via La Masa 34  
 I - 20156 Milano  
 amalia.finzi@polimi.it

**Deutsche Gesellschaft für Luft-und Raumfahrt Lilienthal-Oberth e.V. (DGLR)**

Godesberger Allee 70 – D- 53175 Bonn  
 Tel.: + 49 228 30 80 50  
 info@dglr.de – www.dglr.de  
**President:** Dr-Ing. Detlef Müller-Wiesner  
 detlef.mueller-wiesner@eads.net  
**CEAS Trustees:** Dr-Ing. Norbert Arndt  
 norbert.arndt2@rolls-royce.com  
 and Philip Nickenig - philip.nickenig@dglr.de  
**Secretary General:** Philip Nickenig  
**Adm. Assistant:** Petra Drews  
 petra.drews@dglr.de

**Flygtekniska Föreningen (FTF) – Swedish Society for Aeronautics and Astronautics**

Anna Rathsmann - SSC c/o Rymdbolaget  
 Box 4207 – SE-171 04 Solna  
 Tel: +46-8-627 62 62  
 anna.rathsmann@sscspace.com  
**President:** Captain Roland Karlsson

St - Persgatan 29 5tr, SE - 602 33 Norrköping  
 Tel.: + 46(0)11 345 25 16  
 Mob.:+ 46 (0)705 38 58 06  
 rkrolandk@gmail.com  
**CEAS Trustees:** – Kaj Lundahl  
 klundahl@bredband.net  
 Wiboms väg 9 • SE - 171 60 Solna  
 +46 8 270 264 – +46 703 154 969 (mob)  
 – Prof. Petter Krus : Linköping University  
 SE - 58183 Linköping – petter.krus@liu.se  
 +46 13 282 792 – +46 708 282 792 (mob)  
**Secretary:**  
 Emil Vinterhav – Sankt Göransgatan 135  
 SE-112 19 Stockholm – Tel.: +46 70 555 1869  
 emil.vinterhav@gmail.com

**Hellenic Aeronautical Engineers Society (HAES)**

3, Karitsi Str. 10561 – GR-10561 Athens  
 Phone & Fax (HAES): +30-210 - 323 - 9158  
 Working hours Phone:+30 22620-52334  
 Mob.:+30 697 997 7209  
 E-mail (HAES): admin@haes.gr  
**President:** Ioannis Vakrakos  
 vakrakos@otenet.gr  
**CEAS Trustees:**  
 Triantafyllos (Akis) Tsitinidis  
 ttsitinidis@haicorp.com  
 Tony Economopoulos – ae@otenet.gr

**Nederlandse Vereniging voor Luchtvaarttechniek (NVvL)**

c/o National Aerospace Laboratory  
 Anthony Fokkerweg 2  
 NL- 1059 CM Amsterdam  
 Tel.: + 31 20 511 3651 (secretariat)  
 nvvl@nlr.nl – www. nvvl.org  
**President and CEAS Trustee:**  
 Fred Abbink – f.j.abbink@planet.nl  
**Secretary General and CEAS Trustee:**  
 Christophe Hermans  
 Tel.: 31 527 248523  
 Christophe.Hermans@dnw.aero

**Polish Society of Aeronautics and Astronautics (PSAA)**

Nowowiejska 24 – 00665 Warsaw – Poland  
**President:** Zdobyslaw Goraj  
 goraj@meil.pw.edu.pl  
 Phone: +48 - 22 - 685 1013  
**CEAS Trustees:** Jacek Rokicki  
 jack@meil.pw.edu.pl  
 Mirosław Rodzewicz – miro@meil.pw.edu.pl  
**General Secretary:** Andrzej Zyluk  
**Administrative Officer:** Agnieszka Wnuczek

**Romanian Aeronautical & Astronautical Association (RAAA)**

220D Iuliu Maniu Ave - 061126 Bucharest 6 -  
 Romania, P.O. 76, P.O.B. 174 – www.comoti.ro  
**President and CEAS Trustees:** Valentin Silvestru  
 valentin.silvestru@comoti.ro  
**CEAS Trustee:** Ion Fuiorea < ifuiorea@yahoo.com

**Royal Aeronautical Society(RAeS)**

No.4 Hamilton Place – London  
 W1 J 7 BQ – United Kingdom  
 Tel.:+ 44(0)20 76 70 4300  
 raes@aerosociety.com  
 www.aerosociety.com  
**President:** Phil Boyle  
**CEAS Trustee:** David Marshall  
 marshall.daavid@yahoo.com  
**Chief Executive:** Simon Luxmoore  
 Tel.:+44(0)20 7670 4302  
 simon.luxmoore@aerosociety.com  
**CEAS Trustee:** Paul Bailey  
 paul.bailey@aerosociety.com

**Conf.&Events Manager:** Emma Bossom  
 conference@aerosociety.com

**Schweizerische Vereinigung für Flugwissenschaften/Swiss Association of Aeronautical Sciences (SVFW)**

RUAG/Aviation – Seetalstrasse 175  
 PO Box 301 – CH-6032 Emmen  
 Tel.:+41 41 268 4049  
 www.svfw.ch

**President and CEAS Trustee:** Dr Jürg Wildi,  
 CTO of RUAG – juerg.wildi@ruag.com  
**CEAS Trustee:** Dr Georges Bridel  
 a/o ALR – Gotthardstr. 52 – CH-8002 Zurich  
 Tel.: + 41 79 405 7645  
 georgesbridel@aol.com  
 georges.bridel@air-aerospace.ch

**Central Aerohydrodynamic Institute Russian Aerospace Society (TsAGI)**

1, Zhukovsky St. – Zhukovsky, Moscow region,  
 140 180, Russian Federation  
 Tel.: +7(495) 556 - 41- 01  
**Chief Executive and CEAS Trustee:**  
 Sergey L. Chernyshev, D.Sc.  
 ved@tsagi.ru – www.tsagi.com  
**CEAS Trustee:** Andrey Shustov – shustov@tsagi.ru

**ASSOCIATE MEMBERS****Associate Member: Czech Aeronautical Society (CzAeS)**

Faculty of Mechanical Engineering/  
 Dept Aerospace  
 Karlovo náměstí 13 - 121 35 Praha 2  
 Czech Republic  
**Head of Department of Air Transport:**  
 Daniel Hanus – hanus@fd.cvut.cz  
 www.czaes.org

**EUROAVIA**

Kluyverweg 1 - 2629 HS, Delft, NL  
**President and CEAS Trustee:** Jacqueline Chindea  
 jacqueline.chindea@euroavia.eu  
 Phone: +40 743 00 1578 – www.euroavia.eu

**Von Karman Institute for Fluid Dynamics (VKI, Belgium)**

Chaussée de Waterloo, 72 - B- 1640 Rhode-St-Genèse - www.vki.ac.be arts@vki.ac.be

**SOCIETIES WHICH HAVE SIGNED A MEMORANDUM OF UNDERSTANDING WITH THE CEAS:****American Institute of Aeronautics and Astronautics (AIAA)**

1801 Alexander Bell Drive, Reston, VA 20191  
 megans@aiaa.org  
 carols@aiaa.org – www.aiaa.org

**Chinese Society of Astronautics (CSA)**

PO Box 838 – 10830 Beijing, China (PRC)  
 Pr Wang Jia – csa\_space@yahoo.com.cn  
 www.csaspace.org.cn/

**International Council of the Aeronautical Sciences (ICAS)**

**President:** Dr-Ing. Detlef Müller-Wiesner  
**Executive Secretary:** Axel Probst  
 c/o DGLR – Godesberger Allee 70 – D- 53175 Bonn  
 icas@icas.org – www.icas.org

**Korean Society for Aeronautical and Space Sciences (KSAS)**

Prof. Seung Jo Kim  
 Prof. In-Seuck Jeung  
 enjis@snu.ac.kr  
 sjkim@snu.ac.kr

# EDITORIAL

## CEAS PRESIDENT'S MESSAGE



David Marshall

I am very honoured to have been elected President of CEAS for 2013 by the Trustees of our Board when we met in Bucharest. However before outlining my hopes for CEAS in the year ahead I must first pay tribute to our outgoing President, Pierre Bescond. Pierre has made an outstanding contribution to our community and given us a real sense of direction for the future. In particular the establishment of four strategic aims for our forward activities which will focus our work where I believe we can make a specific and unique contribution to the European Aerospace community. I am very relieved that Pierre will stay on the Board and take the lead on our publications and external relations activities thereby succeeding Francois Gayet who is leaving our Board having also made a very valuable contribution. We all wish him well.

The year ahead will no doubt continue to be very turbulent in both European politics and economics. But any who doubt the importance of Europe as an entity for Aerospace should reflect on the success of Airbus and ESA amongst others ,which both represent world class achievements which could not have happened other than within a European framework. I believe the role of CEAS is to bring the voice and contribution that our national societies can make to this European table and relay back to them the opportunities it presents.

This European agenda is particularly rich at present as it leads into the next Framework programme for Aeronautics and the debate quickens over the future of Defence Aerospace in Europe against the backdrop of the continuing economic challenges. I want to help shape how we should respond to this agenda whose success is vital to our member societies and their members who are the aerospace community.

2013 gives us a special opportunity to make this contribution and demonstrate our relevance through our biennial conference in Linköping, Sweden next September. The theme is Innovation which not only emphasises the essential nature of aerospace but reminds us that we need to bring our best talent to bear on keeping European Aerospace in its leading role. I hope you will look at whether and how you can make a contribution to this event and I hope to meet as many as possible of you in Linköping as well as at our other events throughout the year. Finally I want to wish you and your families a happy and prosperous New Year.

David Marshall

## CONTENTS

<b>CEAS MEMBER SOCIETIES</b> .....	<b>3</b>
<b>THE LIFE OF THE CEAS</b>	
• CEAS Annual Report 2012, .....	<b>5-6</b>
by Pierre Bescond	
• General Assembly and 21 <sup>st</sup> Trustees' .....	<b>7</b>
Board Meeting	
• Steve Stavrinidis awarded the 2012 .....	<b>8</b>
Eugen-Sänger Medal	
• The 1 <sup>st</sup> open network in aerospace sees .....	<b>8-9</b>
the light, by Thomas Vermin	
• CEAS2013, Linköping Conference: .....	<b>9-10</b>
Call for Papers, by Petter Krus	
<b>AEROSPACE AND AERONAUTICS SCIENCES</b>	
• ASD Convention 2012, .....	<b>10-14</b>
Lisbon 10-12 October, by Marc de Champs	
• ICAS 2012 Congress, .....	<b>14-16</b>
by Axel Probst	
<b>AIR POWER</b>	
• The 8 <sup>th</sup> 3AF International Missile .....	<b>17-22</b>
Defence Conference, by Luc Dini	
• The Future of UK Defence .....	<b>23-24</b>
Aerospace, by Tim Robinson	
<b>SPACE</b>	
• The ESA Council at Ministerial .....	<b>24-25</b>
Level, Naples 20-21 November	
• ESA-NASA Cooperation at Mars .....	<b>26-27</b>
is a continuing success	
<b>AEROSPACE EVENTS CALENDAR (CPMIS)</b> .....	<b>27</b>



# CEAS ANNUAL REPORT 2012

By Pierre Bescond



Pierre Bescond  
President of CEAS in 2012

CEAS again had a very busy year in 2012, even though there was no CEAS Aerospace Conference since they are held in odd years. Time and efforts were spent to implement and consolidate our main actions along the roadmap approved a year ago as our strategy plan. All Trustees are highly recognized professionals in the aerospace world and indeed they do help promote aerospace by participating as experts in worldwide conferences and in organisations of all kinds: national societies, foreign societies, international Working Groups and Programme Committees, EC contracts... As I prepare to hand over the Presidency to David Marshall from the Royal Aeronautical Society, I am convinced that CEAS is gradually getting the right recognition from all these organizations as well as from its Member Societies. Our efforts are rewarding and I will enjoy remaining active within the Board.

We met three times at Board level : 1- in the Brussels ESA offices (1<sup>st</sup> of March), on which occasion Dr Jack Metthey, Director "Framework Programme, Interinstitutional Relations", of the European Commission DG Research & Innovation, made a very informative presentation to the Board : "Horizon 2020, The EU Framework Programme for Research and Innovation 2014-2020"; 2-; at the offices of the Hellenic Engineering Chambers Headquarters in Athens (15<sup>th</sup> of June) hosted by HAES; and 3-; at the National Research and Development Institute for Gas Turbines (COMOTI) Headquarters in Bucharest (25<sup>th</sup> of October) hosted by AAAR. We are very grateful to all those who organized beautiful receptions or dinners in these various places.

There was no new member in 2012, except for the confirmation of ESA as a corporate partner of CEAS under terms of agreement which were agreed upon and will be proposed to other European organisations showing interest. Contacts are pursued with societies in a few countries such as Cyprus and Latvia to propose them to become members while I suggested an Austrian Professor to launch the creation of a society in his country which does not have one.

We held a General Assembly meeting before the Board meeting in Bucharest and noted some changes in the Board of Trustees. David Marshall was unanimously elected President of the Board for 2012. Pierre Bescond was elected to succeed François Gayet as VP External Affairs & Publications and as such will chair the PCC when it needs to meet. All other Officers were unanimously confirmed by

the Board: Paul Bailey Vice-President Finances, Dr. Kaj Lundahl VP Awards & Membership, Dr. Christophe Hermans Chairman Aeronautics Branch, Dr. Constantinos Stavriniadis Chairman Space Branch, and Mrs Mercedes Oliver CEAS Director General.

Under the chairmanship of Mr. Gayet, the PCC led the Conference Programming Management Information System (CPMIS) to its maturation in collaboration with ASD. This tool makes some space available for paying adverts and this was used for the first time by the Farnborough Airshow in 2011 while another conference organizer showed interest for its November 2012 event. All Trustees will advertise this possibility within their professional networks. ASD agreed to continue our collaboration in managing and maintaining this finalized version under the same terms.

Our strategic action plan was implemented along its four lines: develop and maintain strong relationships with relevant EU bodies, promote aerospace towards students and young professionals, disseminate knowledge through conferences, journals, and Technical Committees, and engage into organised international co-operation although this fourth line is just being written now, based on the experience gained through the first three ones.

Conferences in 2012 made CEAS visible in many places. The 18<sup>th</sup> AIAA/CEAS Aeroacoustics conference was held in Colorado Springs, USA, 4 – 6 June with a good participation of our experts of the ASC (Aeroacoustics Specialists' Committee). An agreement covering the organisational aspects of these conferences in Europe was signed with AIAA which can be the basis of other agreements of the same type. As President I was invited to give a welcoming speech with an introduction of CEAS at the 38<sup>th</sup> European Rotorcraft Forum ERF 2012, organised by NVvL and co-badged with CEAS in Amsterdam on September 4. At the 61<sup>st</sup> DGLR conference "Deutscher Luft-und Raumfahrt Kongress 2012" in Berlin on September 10, I was exposed, through a videoclip produced by ONERA, as a witness in the opening plenary session for the 100<sup>th</sup> anniversary of DGLR. It also is worth mentioning that several of our Trustees are active in the International Council of Aerospace Sciences and attended its Congress ICAS 2012 in Brisbane, Australia, end of September.

Our members are very actively preparing the 2013 conferences. The 3 major European technical conferences sponsored by CEAS are getting full attention. The CEAS Specialists Conference in Guidance, Navigation and Control CEAS EuroGNC 2013 will take place at the Delft University of Technology, 10-12 April 2013, and will include a joint ECAero forum between CEAS and EUCASS. The 19<sup>th</sup> AIAA/CEAS Aeroacoustics Conference will be held in Berlin, 27-29 May 2013. And the International Forum of Aeroelasticity and Structural Dynamics IFASD 2013 will be

organized by the Royal Aeronautical Society, in the UK for the first time since 1995, in Bristol, 24-27 June 2013.

Then the 4<sup>th</sup> CEAS Air and Space Conference will be organised in Linköping, Sweden, 16-19 September 2013 by the Linköping University and our member FTF, the Swedish Society of Aeronautics and Astronautics, on the occasion of their eighth Congress arranged every third year. Many Trustees volunteered to work within the Programme Committee and bring concrete help to the organisation.

We begin to be much better known and appreciated in the European Commission through a number of programmes and contracts. We participated to the EC RESTARTS (Raising European Students Awareness in Aeronautical Research Through School-Labs) workshop in Brussels February 29, hoping to join the programme by teaming with our member VKI in a consortium which had won the initial contract. Unfortunately, the Commission did not play the continuity in the new FP7 Call and we lost the RESTARTS 2 contract. So we are now aiming other RFPs dealing with promotion of aerospace towards students and young professionals. On ECAero the partners (CEAS, ECCOMAS, ERCOFTAC, EUROMECH, EUROTURBO and EUCASS) obtained an extension of the contract till the end of October 2013. We met six times in 2012, and clearly are beginning to much better know each other and work together at harmonizing the European Aerospace Research landscape. One of these meetings was held in Vienna, Austria, September 14 during the big ECCOMAS Congress (2000 participants) where CEAS organised a joint session with ECCOMAS. As was done in Venice, sessions with papers from all six partners will be planned in the Linköping conference, tentatively better integrated within the conference programme, perhaps along the main objectives set up by the Commission in its 2020 vision. In line with our 2<sup>nd</sup> strategic action line (promote aerospace towards students and young professionals), Mr. Marshall proposed we try and join the EC Advisory Committee for Aeronautics Research in Europe (ACARE) and explore the ways of doing it. There may be a possibility with VKI again and the University of Lester through the Research Programme for Aeronautics described in 2 documents: "Programmes and Initiatives for the Human Potential on European Level" and "Realising Europe's vision for aviation - Strategic Research and Innovation Agenda, SRIA, Volume 1" in which for the first time education is a key point. Our experts certainly can bring a lot to the Commission in this field. The Board approved the initiative and it will be a major effort in 2013. In addition a few but limited contacts were made with other European aerospace organisations like EASA: they will have to be pursued and expanded.

Awards also are a good show case for CEAS. The CEAS Gold Award 2012, extended to Professor Manfred Fuchs, CEO of OHB-System AG was not handed over this year for lack of a prominent adequate event: so to that effect we plan to organize a specific party with OHB in Brussels on the occasion of our 22<sup>nd</sup> CEAS BoT meeting on the 6<sup>th</sup> of March 2013 evening. For the CEAS Gold Award 2013, the nomination of Mr. Louis Gallois, former CEO of EADS, pro-

posed by 3AF and endorsed by RAeS was unanimously approved by the Board. It is planned to extend it at the gala dinner of the CEAS European Air & Space Conference in Linköping.

CEAS endorsed three nominations proposed by the Aeroacoustics Specialists' Committee, for Aeroacoustics awards to be handed over at their Conference in Berlin in May 2013, to Pr. Christopher Morfey from ISVR Southampton for 2011, to Dr. Ulf Michel retired from DLR-Berlin and associate Professor at TU Berlin for 2012, and to Dr. Andrew Kempton, from Rolls-Royce and associate Professor at ISVR for 2013.

I am glad to again extend our warm congratulations to two of our Trustees who were honoured this year. Sergey Chernyshev, Chief Executive of the Central Aerohydrodynamic Institute Russian Aerospace Society (TsAGI), was awarded the French National Order of Merit at a ceremony which took place at the ONERA Meudon Centre (France) on 31<sup>st</sup> January 2012. The medal was handed over by Denis Maugars, CEO of ONERA, in the presence of several French, European and Russian VIPs. And Franco Persiani, from Bologna University and AIDAA President, was inducted Honorary Member of the Greek Society (HAES) by its President Ioannis Vakrados at a ceremony and reception on the eve of our BoT meeting in Athens, 14<sup>th</sup> June 2012. CEAS publications went according to plan in 2012: the four issues of the CEAS Bulletin, always produced and distributed on time by our Editor-in-Chief Jean-Pierre Sanfourche remain a good promotional tool towards European institutions, professional organisations, research establishments and industry. The CEAS Aeronautical and Space Journals were also published according to plan but need more publicity towards all potential authors, in particular those in our conferences who should take advantage of these European publications of choice now that they exist. The website [www.ceas.org](http://www.ceas.org) is fully operational. Mr. Vermin, EUROAVIA President, presented CEAS for Students, a Website dedicated to Students & Recent Graduates, a powerful tool which they created to network internally and with CEAS members.

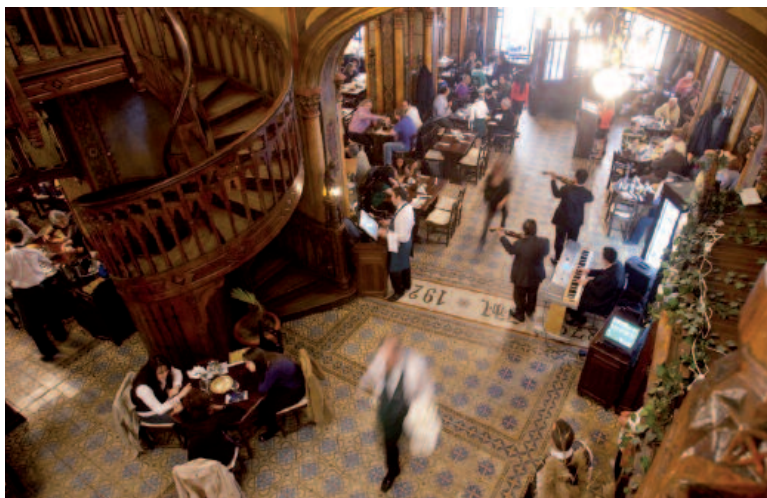
It is also to be mentioned that the editorial coordination of the Proceedings of the Sixth European Commission Aeronautics Days (Madrid, 30 March to 1<sup>st</sup> April 2011) "Innovation for Sustainable Aviation in a Global Environment", issued in last August, has been conducted by Jean-Pierre Sanfourche under Dr Knörzner's management.

In conclusion let me again heartily thank all Trustees and Officers of the Board for their team spirit and the valiant support they provided me with during my two-years tenure. I believe the dynamic for very concrete action is set and I know that with David Marshall at the helm it will not weaken. So on behalf of all of us let me wish him "Bonne chance" and assure him of our continued strong support for this great cause we pursue at the service of our Members: help build a great future for European aerospace.

## THE GENERAL ASSEMBLY 2012 AND THE 21<sup>ST</sup> TRUSTEES BOARD MEETING

The General Assembly 2012 and the 21st Trustees Board Meeting of the CEAS were held on 25 October in Bucharest, hosted by the Romanian Aeronautical and Astronautical Association (RAAA), at the National Research and Development Institute for Gas Turbines (COMOTI) Headquarters, 220 D Iuliu Maniu Bd.

The evening of the day before, 24 October, the RAAA offered the CEAS members a superb dinner at the prestigious CARU cu BERE restaurant located in the Historical Centre Area of Bucharest.



Caru' cu Bere, a true living legend and also one of the oldest beerhouse in Bucharest, was opened for the first time in 1879 in the old Zlatari inn and, after 20 years it moved to Stavropoleos Street, where it can be found even today.

On 25 October, before starting the General Assembly, RAAA President Valentin Silivestru, made an introductory presentation of the COMOTI and recalled the main steps of the life of the famous Romanian aeronautics inventor Henri Coanda.

### 25 OCTOBER 10:00 – 11:00 – THE GENERAL ASSEMBLY

- Pierre Bescond, CEAS President 2011 – 2012, gave reading of the Annual Report 2012: see pp. 5-6.
- The 2013 budget was approved.
- ESA was admitted as Support Donor Member.
- Discharge of two CEAS Trustees: José Luis de Luna Lazaro (AIAE) and Zdobyslaw Goraj (PSAA).
- Mercedes Oliver Herrero (AIAE) and Miroslaw Rodzewicz (PSAA) were admitted at the Board of Trustees.

### 25 OCTOBER 11:00 – 18:00 – THE BOARD OF TRUSTEES MEETING

Among the major decisions and discussions:

- **Elections** for the Year 2013: David Marshall was elected as successor of Pierre Bescond for the CEAS presidency – Pierre Bescond will replace François Gayet as Vice-President, Publications and External Relations – No change for the other members: Mercedes Oliver, DG – Paul Bailey, Finance – Kay Lundahl, Awards &

Membership – Christophe Hermans, Aeronautics Branch – Constantinos Stavrinidis, Space Branch – François Gayet, Programme Coordination Committee.

- **Strategy Plan:** in course of finalization David Marshall.
- Preparation of CEAS 2013 **Linköping** Conference: see page 9.
- **E'CAERO:** this point was lengthily presented by Pierre Bescond: see Annual Report 2012 page 5-6.
- **ACARE:** has created a Working Group "Strategic Research Agenda – Flight Path 2050": RAeS is the only CEAS Member participating in it, David Marshall said. It is highly desirable that other CEAS Member Societies are getting involved: action to be actively followed.
- **EUTELSAT:** Jean-François Bureau, Director for institutional & International Affairs, who attended CEAS 2011 Conference in Venice, was very interested by CEAS activities. Pierre Bescond offered this Institution to become a CEAS Partner Member. Action in course of implementation.
- **EUCASS:** a joint session EUCASS/CEAS will be set up at the upcoming CEAS/DGLR GNC Conference.
- **EUROAVIA:**
  - Each CEAS Member Society is giving local support to EUROAVIA activities (conferences, workshops);
  - Jacqueline Chindea (Romania) is the new President, succeeding to Thomas Vermin;
  - EUROAVIA will participate in the Electoral Meeting of the EUROAVIA Congress (EMEAC) which will take place in Bremen on 22-28 April 2013 (the EMEAC is hosted every spring by one of EUROAVIA associations). An interview with the CEAS Bulletin will be organised.
- **CEAS Awards:** presentation of Award 2012 to Prof. Fuchs and of Award 2013 to Louis Galois are being organised – The Call for Proposals concerning CEAS Award 2014 has been issued by Kaj Lundahl.
- **NEXT MEETINGS:**
  - 7 March 2013 in Brussels (at the ESA Office): (i) Extraordinary General Assembly for approving the 2012 accounts, nominating new trustees and defining New Member statutes – (ii) 22<sup>nd</sup> Board of Trustees Meeting.
  - 6 March evening: cocktail or dinner.
  - June 2013 (day TBD): 23<sup>rd</sup> Board of Trustees meeting in London RAeS/HQ, or Farnborough, in the national Aerospace Library.
  - 19 September 2013: 24<sup>th</sup> Board of Trustees Meeting in Linköping.
- The end of the meeting was declared at 18:00.



## STEVE STAVRINIDIS AWARDED THE 2012 EUGEN-SÄNGER MEDAL

By J.-P. Sanfourche

Constantinos Stavriniadis, Head of the CEAS Space Branch, was awarded the 2012 Eugen-Sänger Medal by the DGLR (Deutsche Gesellschaft für Luft- und Raumfahrt), the German Society of Aeronautics and Astronautics, on 12 September 2012.

The Medal Ceremony took place during the DGLR Congress in the Estrel Hotel in Berlin with more than 150 in attendance. Thomas Reiter, ESA Director for human Spaceflight and Operations read the Laudation and presented Constantinos (Steve) Stavriniadis with the medal.



In 1965 the DGLR honoured the Austrian Aerospace Engineer, Eugen-Sänger, for his pioneering work in rocketry, re-usable space vehicles and space travel. By creating a medal to be awarded in his name, the DGLR pays tribute to his passion for space travel, his personal engagement, and outstanding contribution to the field of Astronautics. Over the intervening years, the DGLR has awarded the Eugen-Sänger Medal to other individuals, whose passion and pioneering work in the field of Astronautics resonates with the spirit and accomplishments of Eugen Sänger. This year the honour was bestowed upon our colleague Prof. Dr Constantinos Stavriniadis for his outstanding perso-

nal engagement and contributions to Astronautics. In the field of mechanical engineering, he is acknowledged to be an eminent contributor to technical knowledge and its application to large space projects. His advancement of the level of knowledge and understanding of structural mechanics and dynamics is internationally recognized.

Through his vision and leadership he has promoted technological exchange between industry, space agencies and professional organisations to increase knowledge and engineering capability.

Constantinos Stavriniadis graduated with Bachelor and Master of Science degrees in Aeronautical Engineering, from Imperial College, University of London, and obtained his doctorate in Structural Dynamics from University of Stuttgart, and University of London.

He joined ESA in 1976. For the last three decades, he has been the driving force in advancing satellite and structure techniques in Europe. He has significantly contributed to the success of many of Europe's major space programme and his role in space vehicle development and verification has been essential for many of ESA's missions. In establishing the verification requirements for the International Space Station's Columbus, he is the only person outside the USA to be entrusted by NASA with the Space Shuttle models. He has received an Honorary Doctorate from the Moscow Aviation Institute.

He is Visiting Professor at the Surrey Space centre and at the University of Strathclyde. He is a member and current chairman of the research Advisory Board of Imperial College's Department of Aeronautics, London. He is Chairman of NAFEMS the international organisation for the advancement of engineering modelling and simulation. ■

## THE FIRST OPEN NETWORK IN AEROSPACE SEES THE LIGHT

By Thomas P. Vermin



Thomas Vermin, aerospace engineering student at TU Delft, is the former president of the European Association of Aerospace Students EUROAVIA. He is presently CEAS Trustee to Students & Young Professionals and Head of the Students in Aerospace Initiative.

In what must be the most overhyped story of our time, a couple of programmers build the next application on an attic, only to sell it months later for a couple million dollars. Everywhere you seem to turn, you hear stories about million dollar valuations for a game, billion dollar valuations for a social network that doesn't actually do anything. In the world of advertisers and marketers, it doesn't actually matter anymore what kind of quality the content is, rather the amount of people using it. An angry bird's game application sells for millions more than a thorough website with excellent quality in writing. Yet still, people wonder why our best engineers work on designing the next shampoo bottle rather than the next space craft.

With today's growing shortage of skilled workers in the industry, the finger pointing has already begun. In his latest installment in MIT's Technology Review, Jason Potin



argued that it is the venture capitalist of today that is the reason of our failure to attract skilled workers to the right causes. The short term goal of turning an idea profitable makes an investment in a company that does something incremental so much more attractive than a long term investment in a company that might change an industry. Is he right? Perhaps, but it doesn't paint the full picture.

The full picture, at least for the aerospace industry, sketches a conservative industry that is averse to adapting new technologies to send an informative, transparent message to those eager to receive it. In an age where 95% of the youngsters use social media, Skittles, which brought us round, colorful sweets, reaches out to 23 million people, while NASA, which brought us the moon landing, barely has a million fans. The contrast is stark, and unfortunately for the aerospace industry, NASA is top of the class in amount of fans. Fortunately, aerospace industry has a lot of things going for itself. Our accomplishments are more elusive than any other industry, and we are very able to produce graphically attractive content, something that is vital in this day and age.

With that in mind, the Students in Aerospace initiative intend to bring a game changer to the table. Converging on existing technologies, it is a social network builds the aerospace way. In it lies the foundation to inspire and educate a whole new generation of aerospace pioneers. It is the first entity within the aerospace world that doesn't have boundaries. No need to be of a certain nationality, or to pay

a fee, there is even no need to sign up. With the mission to encompass the entire aerospace world on one platform, it is the first social network in the world that doesn't ride on the motivation to return a profit. It runs on the motivation to inspire, to motivate and to elevate the aerospace industry to the next innovation.

In its earliest form it saw the light this November 6<sup>th</sup> on studentsinaerospace.com, after a 4-month journey from foundation to launch that brought about more than 35,000 followers on the social networks. It demonstrated the potential of this network that the idea alone was able to gain more followers than ESA, Lockheed Martin, or Airbus Careers in the span of 4 months. There were more followers than professionals in the entire span of the CEAS societies. The imminent next step is to improve the platform so that it attunes to the demands and needs of students and industry until it is so perfect in its execution that is a natural addition to existing infrastructure.

After the platform achieves this level of quality, the most elaborate reach out campaign will engulf more than 250 universities worldwide and 250 major companies in the industry in order to bridge the connection between students and industry. From there on, the platform aims to become the cornerstone in sharing and connecting the aerospace industry. Just like the most overhyped story of our time, this platform was built by a couple programmers on an attic somewhere, but the outcome of this story will be different in its entirety. The potential is literally bring people to the moon and beyond. A small step for a big leap. ■

## CEAS 2013 LINKÖPING 16-19 SEPTEMBER: CALL FOR PAPERS

By Prof. Petter Krus



Petter Krus, Professor In Fluid and Mechatronic Systems at Linköping University, is Chairman of the CEAS2013 Programme Committee.

CEAS2013 will be a joint event between the 4<sup>th</sup> CEAS European Air & Space Conference (after Berlin 2007, Manchester 2009 and Venice 2011), and the 8<sup>th</sup> Congress on Aeronautics and Astronautics arranged every third year by Flygtekniska Föreningen (FTF), the Swedish Society of Aeronautics and Astronautics.

This conference, which is organised by FTF and Linköping University, will take place in Linköping (Sweden) from 16 to 20 September 2013.

It will address all disciplines of aeronautics and aerospace systems including research & technology (R&T), design, development and operations.

The central theme will be: "Innovative Europe".

### MAJOR CONFERENCE TOPICS:

- Innovative future Air and Space systems and technologies
- Collaborative engineering and research
- Air Traffic Management (ATM) and flight operations systems
- Research and Technology for Air Power
- Education for Aeronautics and Space
- Emergent industries and markets

### INVITATION TO PARTICIPATE: SUBMISSION OF ABSTRACTS

You are invited to submit before 15 February 2013:

- Extended 3-page abstract for full paper presentation
- Or 1-page abstract for oral presentation only.
- Conference language: English

### KEY DATES:

- 15 February 2013: abstract submission
  - Notification of abstract acceptance: 15 April 2013
  - Full paper submission: 1st of August 2013
- All documents will be in PDF-format.

**ADDRESS**

Please address all communications to:  
ceas2013@iei.liu.se

**PROCEEDINGS**

After the Conference, the sites URL [www.ceas2013.org](http://www.ceas2013.org) will be focused on the electronic conference proceeding as hosted by the publisher Linköping University Electronic Press, that is part of the Scandinavian on-line academic archive DIVA, currently including 30 universities and institutes in the North of Europe. The proceeding contributions will then be published as an open access peer-reviewed

proceeding and searchable through many scientific database tools and internet search engines.

**FURTHER INFORMATION**

Further information about the Conference:

<http://www.ceas2013.org>

Pages are being updated regularly.

**NOTE:** the complete Call for Papers is available at [www.ceas2013.org](http://www.ceas2013.org) and also [www.flygtekniskafoeringen.org](http://www.flygtekniskafoeringen.org)



## THE ANNUAL ASD CONVENTION WAS HELD IN LISBON FROM 10 TO 12 OCTOBER 2012

By Marc de Champs, ASD, and Jean-Pierre Sanfourche, CEAS

AICEP and DANOTEC organized from 10 to 12 October in Lisbon, the annual convention of the AeroSpace and Defence Industries of Europe (ASD).



Mr Jean-Paul Herteman, Chairman and CEO of Safran, became President of the ASD for the term 2012-2013, succeeding Mr Klaus Eberhardt, CEO of Rheinmetall. Left, Klaus Eberhardt. Right, Jean-Paul Herteman.

- It was the first Convention to be accompanied with a Technological Forum, a new tool to promote better networking among business players and between the R&D entities and Universities.



The 2012 edition achieved two relevant milestones:

- A very high attendance, with over 800 delegates from the industry, Parliaments, European Institutions and Governments;

The Technology Forum, designed as an added opportunity to debate the industry's main challenges, pursued three goals:

- To operate networking opportunities;
- To enable the exchange of technical/business information;
- To promote cooperation in the area of Ideas and Talent.

The novelty of the Forum brought upon the organisation the responsibility to engage visitors, allow them to take part of the seminars they considered especially relevant, enable opportunities to identify and meet new partners and to also learn about specific projects. This was achieved with a complete and coherent set of spaces and experiences where the participants could navigate according to their specific interests. Static exhibition – a showcase of some of the most interesting Portuguese projects in UAV/UVS – was a display of the Convention Centre, enabling a project-based discovery of local partners, both in the business and

R&TD areas.

Exhibition: close to 60 booths, featuring Portuguese and foreign companies, provided visibility and enabled the visitor to have a glimpse of some of the most active companies in the aerospace and defence industry in Europe.

Seminars: two parallel seminar programmes, one focusing on Ideas and Talent, the other on Business, provided the opportunity to openly debate the hottest topics the industries face in the development of their business in fostering R&TD activities and partnerships, and also in engaging young talent to the scientific areas that will support future innovations.

## SPEECHES

We have here after reproduced two Addresses: by Klaus Eberhardt, President of ASD for the term 2011-2012, and by Jean-Paul Herteman, on assuming his position as President of ASD for the term 2012-2013. see pages 11-14.

## THE TECHNOLOGY FORUM: SEMINAR FOR IDEAS AND TALENT

Twelve themes were covered:

- Engaging Children in Space and Astronomy – Dr Ana Noronha, Executive Director, Ciência Viva Agency;
- The Flying Classroom Initiative - Klaus-Peter Ludwig, Director Industrial Relations, EADS Public Affairs PA/G;
- “Think Industry” project - Gonçalo Lobo Xavier, Portuguese Technological Centres Network, RECET;
- Research Synergies – Politecnico di Torino and Industries – Prof. Ing. Fulvia Quagliotti;
- ACARE Strategic Research and Innovation Agenda, the challenges 1-2-3-4-5 – Nicolas Evanno, ASD R&T Manager;
- The EASN Network, its objectives and activities – Prof. Ing. Fulvia Quagliotti;
- Success Stories within the frame of the EASN Activities – Prof. Krzysztof Kurzydowski, Warsaw University of

Technology – Prof. Dr-Ing. Spiros, President EASN, University of Patras;

- Cooperation with Universities – Rick Parker, Director R&T, Rolls-Royce;
- How Research Establishments can help Industry maintain European leadership in Aeronautics and Air Transport – Paul Eijssen, Head of EREA Executive Secretariat;
- The CARE Project – EACP Network;
- Lifelong Learning Policies & Programmes – Antonio Silva Mendes, Director DG EAC, European Commission;
- The Clean Space Initiative – Tiago Soares, ESA/ESTEC.

## THE TECHNOLOGY FORUM: SEMINAR FOR BUSINESS

Eight items were dealt with:

- Open SMEG (Small and Medium Size Enterprises Group): Innovation in Structural Panel Technology – The Aviation Platform for Superior Cooperation;
- AIRBUS Technology Roadmap – Gareth Williams, Head of R&T development, AIRBUS;
- ASD at the Heart of European Defence R&T Cooperation, THALES;
- ASD-STAN Workshop: How to build interoperability into your Technology Roadmap;
- The “TAPAS” Project – Arnt Offringa, Director R&D, Fokker;
- Business Environment and Opportunities in Portugal – AICEP;
- UAS Industry – Is Europe still in the race? – Dr Aimó Buelte, Head of R&T, Cassidian, and Chairman of ASD/ASG Management Group;
- EDA Views on UAS in Europe – Christian Bréant, director R&T,EDA.

For further information :

[www.asd-europe.org/index.php?id=133](http://www.asd-europe.org/index.php?id=133)

## ADDRESS BY KLAUS EBERHARDT, PRESIDENT OF ASD FOR THE TERM 2011-2012

Ladies and Gentlemen,  
Honoured Guests,  
Dear Colleagues and Friends,

The time has come....

When I took over the Presidency of ASD in Istanbul a year ago, I outlined my priorities for the year to come and I told you that **defence would be a key focus of my efforts and attention.**

### Why ?

The European defence industry was and still is at a crossroad. Indeed many EU countries were - and still are -

faced with a difficult budgetary situation which puts defence spending under enormous pressure, now and for many years to come. Against this backdrop collective initiatives have gained highest priority and in this context ASD's role is more relevant than ever.

In Istanbul the Council tasked the Defence Commission - chaired by our Friend Hans Christoph Atzpodien - to perform an **analysis of the current situation of the European Defence Industry** and to look for recommendations how to overcome the problems that we face. In our Council meeting in April he presented what he entitled “A wake up call” giving five requirements addressed towards both member states and European Commission. The necessity of such analysis is proven by the fact that since the paper has been published, at every major event these statements

were commented, reflected and repeated like a mantra, last time three weeks ago by several speakers at the

Conference co-chaired and organized by EDA and the Cyprus Presidency.

We at ASD are going to be **increasingly solicited by EU stakeholders such as the European Defence Agency, the European Commission and the European Parliament** to articulate common industry views on the main issues facing the Defence Industrial Base. For instance Madame **Claude-France Arnould**, Chief Executive of the European Defence Agency, has been calling on our industry to engage more interactively with relevant decision-makers to shape the debate on defence industrial capabilities in the context of enduring budgetary constraints. I am very glad that Madame Arnould has repeatedly accepted our invitation to attend our Convention here in Lisbon.

During my presidency ASD continued to lobby for the emergence of a **coherent EU defence market framework** strengthening the European industry – which will cause a standardisation and synchronisation of procurement requirements. We will continue to plead for a generalisation of pooling and sharing practices, starting with the need to harmonize military requirements. Last but not least we will continue to fight for increased fundings in research and technology, which are mandatory if we want to avoid the irreversible disappearance of key technological capabilities on our continent.

I also emphasized a year ago that the **consolidation of the European defence sector** is overdue and that it would be better and easier for us to initiate this process before governments launch it outside of our control. I made this statement but I was not aware, that 9 months later the two European Defence Giants EADS and BAE initiated a merger that – in case it would have materialized – would have changed the scene totally. Whatever the political reasons have been not to execute the planned merger, I still emphasize that the consolidation of the European defence

sector is overdue and that it is our management responsibility towards our stakeholders to be in the driver's seat for intelligent initiatives generating shareholder value and proving social responsibilities.

In the **field of security** we continued to lobby for the adoption of legislation supporting the development and implementation of EU- based security solutions, in particular with regard to privacy and data protection and liability regulations. We also supported the establishment of European Security Programmes in Border Control, Civil Protection, Protection of critical infrastructures and the rapidly expanding field of Cyber Security.

A year ago I said that we need to better **include smaller countries in our activities**, through both their national associations and their member companies.

As for the so called "Less bigger associations" it is essential to have their representation with us in our ASD association, because it gives us the weight we need to stand for our European Industry as a whole.

As for the **SMEs**: I think the Technology Forum being held yesterday has shown impressively the **importance of Small and Medium enterprises** and the role they play for the defence industrial landscape. Keeping them at the forefront of innovation and competitiveness and enhancing their skills to conduct cross border transactions is in the interest of all of us.

Finally, a year ago I said that a key priority of my mandate would be to **make our association more efficient**. Seven years after its establishment the time was overdue to reconsider both the internal processes and the external mandates. For over a year the ASD Secretariat has been undertaking a focused restructuring program that will completely renew our association under both budgetary and organisational aspects.

But this not enough: At our Council meeting on 19th April we decided to establish a so called "Wise Men Group" a body with an outside and impartial view on both ASD's lobbying tasks and its own organisation. The intention was to make ASD leaner, more focussed and fit for purpose.

We discussed their analysis and recommendations yesterday evening in the Council and this morning in the Board and I am absolutely confident that they provided us with valuable guidance that will lead us to a freshly renewed, powerful Aerospace and Defence Industries Association that has the ability the two missions policy making at a European level and being the tool of our industry for lobbying and advocacy.

Before I officially hand over let me thank all of those that gave their support with their full passion to enhance my presidency, especially my fellow presidents Domingo Urena-Raso and Jean-Paul Herteman who accompanied me whenever needed. The same applies for the Secretary General and his whole team.

Moreover I think the ASD team that prepared this convention did a terrific job and the same applies for our Portuguese hosts that received us with their utmost hospitality.

**I think, they all deserve our tremendous applause.**

So now time has really come: It is with extreme confidence and trust that I am pleased and honoured to hand over the Presidency of our association to Jean-Paul Herteman, Président Directeur Général of the SAFRAN Group.

*Monsieur Herteman, je vous prie...*





## ADDRESS BY JEAN-PAUL HERTEMAN ON ASSUMING HIS POSITION AS PRESIDENT OF ASD FOR THE TERM 2012-2013

Mr. Secretary of State, Madame la Directrice générale, Distinguished Guests, dear Marion, dear David, dear colleagues and friends, dear Klaus,

First of all, I would to pay tribute to you, Klaus, for your work at the head of our association. Under your leadership, our Council in particular behaved more as a team, and began to shape a common vision of European policy concerning strategic industries, as well as a roadmap to further enhance the efficiency of our association. Very thank you once again Klaus.

I would start taking a brief look back at the last ten years. In 2002, for the first time, industry leaders, European Commissioners and representatives of the European Parliament and Council proposed a strategic vision and joint action plan, within the scope of the so called Star 21 report. For the very first time in these bodies, the word "industrial policy" was pronounced. Reflecting the same approach, the AeroSpace and Defence Industries Association of Europe, or ASD, was created in 2004 by joining the forces of AECMA, EDIG and Eurospace.

A number of initiatives emerged in the wake of this strategic impulse, some very positive, others maybe more questionable or imperfectly applied. Over the last decade we have seen the creation of the Single European Sky, ACARE, Clean Sky, SESAR, Galileo and the European Defence Agency, along with research on security issues, the emissions trading system for airlines, and various defense and security market directives.

These initiatives have advanced discussions on the necessary convergence between the public interest, as expressed by European political authorities, and the demand for greater competitiveness by companies addressing these markets, whether in Europe or most importantly around the global world.

**However, Europe's stakes, as identified in 2002, have not been fully addressed, and much, much, remains to be done. And in the same time, the world has undergone radical changes, and Europe now faces challenges at a level maybe unseen since the end of World War II.**

The first is the increasing importance of emerging nations. These countries now account for nearly all growth in global demand in each of the business sectors of our industry.

– This trend certainly applies to civil aviation, where China now represents twenty percent (20%) of the global market, and it will outpace both Europe and the United States by the end of the decade. The commercial airplane fleet in emerging countries will increase three-fold in the next twenty years, giving it more than half of the total.

– The defense sector is experiencing the same trend, with emerging economies already accounting for sixty percent (60%) of world military contracts, and this share is growing steadily.

– It will also soon apply to the security market, as major emerging countries install systems based on the latest technologies far quicker than we do ourselves.

Given their dynamic performance, emerging countries naturally want to be positioned as world powers. They want to, and they will, develop their own strategic industrial base, and lower their dependence on foreign technologies and products.

The European aerospace, defense and security industry doesn't really have any other choice: we must boldly seize the opportunities offered by this rapidly evolving situation and in the same time identify and control the risks involved. Rising to this challenge is more critical than ever because our industry is today one of Europe's very top assets in the headlong rush towards globalization.

Second challenge: climate change and the increasing scarcity of energy resources.

The air transport industry has grown twice as fast as global GDP over the last forty (40) years, driven by people's permanent hunger for worldwide mobility. We have been able to achieve this impressive growth just because in the same time, our investments in technology have enabled us to cut fuel consumption per passenger and per mile four fold!

For air transport to continue to grow, it must stabilize a carbon footprint within a few decades, and thus we have to find ways to again cut our fuel consumption in half over the next twenty years and then transition out from pure fossil fuels.

This is a real industry-wide effort. We can make it, but without public support and guidance for our technological and industrial investments, we won't be able to meet this target. The third major challenge, and not the least, is the economic crisis.

We are all very familiar with the situation: suffocating debt, flat growth, tight credit, especially for small and medium businesses, the temptation to make short-term decisions that could undermine our foundations for future developments, budget cuts that will impact infrastructures and both civil and military investments that do not take a holistic view.

For an industry like ours, developing and maturing a technology is nothing but a very long and risky process. Investing heavily now despite the crisis is critical to enable us emerge from the crisis. And if we don't, we will be out of the game maybe in ten or twenty years, but it will be forever.

**Under these conditions, we have to focus our efforts on five major issues.**

The first is the Single European Sky. The technological revolution in air traffic management (ATM) reflects a fundamental objective – it will reduce our carbon footprint by about ten percent (10%). But moreover, it's also pivotal for

all of our industries. The cockpits and avionics on tomorrow's aircraft will have to be redesigned, and all air operations will be structured by the new ATM system. SESAR cannot settle for second best behind the Americans' NextGen. The European Aviation Safety Agency (EASA) has to bolster its global influence by signing bilateral agreements with emerging countries in the same time. And in addition to that, we do need the Galileo satellite navigation system for everything to work together smoothly.

The second issue is space. Access to space is a matter of sovereignty. Access to space is an exceptional lever that supports European policies in major sectors such as transportation, environmental protection, border control and fighting natural disasters. We have to find a way to better convince the relevant institutions, which do not feel concerned by the space sector itself, but are directly involved in these policies. From this standpoint, the decisions to be made next month during the ESA ministerial-level conference, as well as decisions on Galileo and GMES program financing, are critical.

The third issue is Research & Innovation. The European Union has enjoyed striking success in these areas, but this is often not very well known. And as an industry association, we are perhaps guilty of not sufficiently informing citizens how far we have come in constructing a Research & Technology network in Europe.

Our industries have played a pioneering role, in particular by contributing to key initiatives such as ACARE and Clean Sky. These Research & Innovation efforts have driven the many successes of the European aerospace, defense and security industries all over the last twenty years.

But we can't rest on our laurels. In today's multipolar world, once again, Europe's position will depend on daring to set now very ambitious goals in our sectors. Europe cannot be strong and spread its influence without being equally strong in aerospace, defense and security. The European Commission teamed up with industry to express our ambitions through the so called "Vision 2050". We now have a more unified framework that will combine the decisions settled by political authorities for society, with the investment decisions carried out by us and the industry.

However, it's not only now time to talk about the "Vision 2050". It's just time to do it. And doing it means accomplishing major technology breakthroughs, not only incremental improvements. In its proposal for the future research and innovation program, H2020, the European Commission proposed a forty percent (40%) increase in the transportation budget – an amount truly reflecting the heady challenges involved. But the debate on the European Union's financial outlook is cause for great concern not to say more. The risk that now weighs more generally on European research financing is very real. If we want – and we want – to make sure that the current financial crisis does not force us to renounce our future

ambitions, and imperil Vision 2050, we together have to mobilize our efforts to increase European funding for innovation just right now.

The fourth main issue is security. Many opinion polls clearly indicate that security is one of the main things that European citizens expect from Europe. Over the years, the EU's actions in this sector have become increasingly concrete. They now affect areas as diverse as visas, asylum, border control and airport security.

The next step is the GMES program, which is currently being to some extent held hostage to European budget discussions. But it must take concrete shape now. The heart of the challenge is to guarantee our technological and industrial independence, so we can maintain the resources needed to meet today's security challenges inside a very complex geo-strategic environment.

The last issue is defense. It is sometimes said that the European defense industry is not competitive enough, that it's too fragmented.

First of all, we are very competitive indeed. From missiles to ships, from airplanes to helicopters, from tanks to combat gear, the systems and equipments produced in Europe are at the cutting edge of military effectiveness. As for development costs and lead times, we are in fact very often much better than our counterparts across the Atlantic. And we have nothing to be ashamed about in terms of unit production costs, even though we often have smaller production volumes, and the euro-dollar exchange rate does not help things.

Second, it's true that in several areas, further consolidation could strengthen our industry. But – and we have had this week and outstanding example of it with the blocking of the BAe- EADS merger – nothing can happen in this field without the willingness and full support of political authorities. It's normal. But it has to be fully undertaken by every stakeholder.

Dealing still with fragmentation, I would like to quote a comment made by Domingo Urena Raso, the President of Airbus Military. He pointed out that, while the A400M military transport plane is produced by an integrated manufacturer, EADS, on a single assembly line, it is nonetheless built in six different versions, each matching six different national technical requirements. If we are to combat fragmentation, that also means accepting that it is perhaps the "demand side" (and not the "supply side") that must first be restructured.

And in any case, we should ever take in mind that the number of jobs and the value created in our industries will depend less on their organization than on sales volume. It's also worth remembering that the competitiveness of our industries decreases exponentially as the complexity of the market increases.

We are poised on the eve of major budgetary and strategic decisions that are critical for our industries and for Europe.

We have to move forward on the above five issues.

It's up to you and me to combine our efforts all together with the Commission's industrial policy initiatives to jointly build a more unified and concrete vision of Europe's strategic interests.

It's also up to us to focus our efforts, through ASD, so we can influence the decisions to be made. A more dynamic,

more responsive and more efficient ASD will help us emerge from the crisis by spearheading innovation and tomorrow's technologies. It is these capabilities that will allow us to stay in the race, and even, as shown by a number of companies in our sectors, lead the race.

You can count on my best efforts as President of ASD in contributing to meet these goals.

Ladies and gentlemen, thank you for your attention.

## ABOUT THE ICAS 2012 CONGRESS

By Axel Probst, ICAS Executive Secretary

The ICAS 2012 Congress was held in Brisbane, Australia, at the Convention & Exhibition Centre in Queensland, Australia, from 23 to 28 September 2012.



A view of the Brisbane Convention & Exhibition Centre



The ICAS 2012 Management Panel. From left to right: ICAS President, Dr D. Müller-Wiesner; Dr A. Paull; Dr K. Bowcutt; Dr D. Dolvin; Dr M. Smart.

It was the 28<sup>th</sup> edition of the biennial ICAS Congress. The Australian Division of the Royal Aeronautical Society (RAeS) acted as host Society for ICAS (International Council of the Aeronautical Sciences).

Concerning the participation, this Congress was the most successful in the ICAS history, with more than 800 delegates among which was a record number of postgraduate research students. The Congress commenced with the ICAS Daniel & Florence Guggenheim Lecture presented by Dr Bill Schofield (Australia), and this was followed by more than 350 technical papers presented by leading authorities from over 40 countries.

ICAS President, Dr Detlef Müller-Wiesner, summed-up by saying:

"The Congress clearly met its key objective of providing a unique global forum for scientists, engineers, managers and students from industry, government agencies and universities to learn, to debate and share ideas and technical information about key issues for the aeronautical industry."

### THE ICAS DANIEL & FLORENCE GUGGENHEIM LECTURE: COLLABORATION CHALLENGES IN THE GLOBAL AEROSPACE MARKET FOR SMALLER COUNTRIES: AN AUSTRALIAN PERSPECTIVE

By W.H. Schofield, Australia

The author gives a description of the Cooperative Research Centre for Advanced Composite Structures, Victoria, Australia. He presents all studies and tests conducted within this establishment, among which: load studies; vortex breakdown of a F-18 Model in AMRL water tunnel; PC-9 fatigue test; mechanical repair; composite repair; stress corrosion crack repair; strain reduction on wing pivot fitting F 111; fast stress scan on leading edge; Wessex input pinion failure.

### A NUMBER OF HIGH-QUALITY INVITED LECTURES WERE ALSO PRESENTED – AMONG THEM:

- BEYOND THE BLACK BOX: THE FORENSICS OF AIRPLANE CRASHES

By George Bibel, University of North Dakota, USA

The author explains the science of safety. He highlights the

fact that the airplane crashes are in fact highly survivable, showing many examples. He explains decompression and hypoxia accidents and he presents the manner in which aircraft crash can be tested on ground.

- LESSONS LEARNT IN FULL COMPOSITE AERO – STRUCTURES DEVELOPMENT IN JAPAN  
By T. Ishikawa, JAXA, Japan

The paper presents the numerous lessons learnt in full-composite aero-structure development: foundation of Mechanics of 2D Textile composites - buckling and post-buckling induced failure or stiffener – clarification of compression after impact mechanics – mechanics of compression after impact of stiffened panels – mechanism of inter-laminar strengthening by switching. This accumulation of lessons learnt raise potential of Japan's aero-structure industries in Composites Area.

- MULTIDISCIPLINARY AIRFRAME DESIGN OPTIMISATION: LAGRANGE  
By Dr Gerd Schumacher and Dr Fernan Daoud, Cassidian Air Systems, Germany

The optimisation assisted airframe design process has been established and applied within all design phases of a broad range of aircraft projects: civil and military applications – components – large assemblies – full aircraft. The multidisciplinary design optimisation with LAGRANGE leads to a feasible airframe design which satisfies the requirements of all relevant disciplines with minimum weight. The automation of both loop – structural sizing and loads loop – results in a tremendous reduction of development time and effort. The in-house LAGRANGE software availability allows the fast adaptation to advanced analysis methods as well as to new technological product and customer requirements: further applications and co-operations are welcomed.

- VOLCANIC, WEATHER AND CLIMATE EFFECTS ON AIR TRANSPORT  
By Ulrich Schumann, DLR, Germany

This paper deals with: volcanic ash hazard avoidance by improved ash detection methods; improved traffic guidance around weather hazards based on now casting; mitigation of climate effects by route optimisation using new prediction tools.

Conclusions are: (i) Volcanic, weather and climate effects have common impact on aviation; (ii) Safety, efficiency and climate sustainability have in common that they require an efficient air transport system, in particular an intelligent air traffic management (ATM) in close connection with weather/hazard/climate prediction to minimize the impact of disruptive events and find cost and climate optimal routing; (iii) New results on ash visibility and contrail predictability have to be taken into account; (iv) Satellite methods are required for identification of not only critical regions but

also regions that are free of hazards.

- HIFIRE: AN INTERNATIONAL COLLABORATION TO ADVANCE THE SCIENCE AND TECHNOLOGY OF HYPERSONIC FLIGHT  
By Kevin Bowcutt, The Boeing Company, USA; Douglas Dolvin, WPAFB, USA; Allan Paull, DSTO, Australia; Michael Smart, University of Queensland, Australia

In this paper, the authors describe the Hypersonic International Flight Research & Experimentation Programme. "HIFiRE" was created to increase knowledge base for critical hypersonic phenomena and mature technologies: it comprises nine focused research projects, each culminating in a flight experiment conducted with a sounding rocket accepting a certain technical risk. As a matter of fact, hypersonic environment is difficult to replicate in ground test facilities, and primary objective of "HIFiRE" is precisely to achieve flight experiments faster and at lower cost than traditionally available. To execute this programme, the resources of a diverse and capable international team were assembled and effectively employed.

#### AWARDS

The ICAS von Karman Award for International Cooperation in Aeronautics was presented to Dr Allan Paull and Prof. Michael Smart of Australia, and Dr Kevin Bowcutt and Mr Douglas Dolvin of the USA.

#### THE ANNOUNCEMENTS DURING THE CLOSING CEREMONY

It was announced:

- That the 29<sup>th</sup> Congress – ICAS 2014 – will be held in St-Petersburg, Russia, from 7 to 12 September 2014;
- That the ICAS presidency for the next two years is to pass to Prof. Murray Scott, Australia.

In accepting the position, Prof. M. Scott reflected on the honour of being the first ICAS president residing outside Europe or North America, and stated that "Over the next few years, ICAS will conduct meetings in the USA, South Africa, Russia and Korea, and this reinforces the truly global nature of the ICAS community and the diversity of the International aerospace industry."

---

A CD-ROM containing all 544 full papers can be purchased at the ICAS Secretariat – c/o DGLR – D653175 Bonn, Germany – Mr Axel Probst - icas@icas.org

---





## THE EIGHTH 3AF INTERNATIONAL MISSILE DEFENCE CONFERENCE

3AF, the French Association for Aeronautics and Astronautics (Association Aéronautique et Astronautique de France) has an expert pool of knowledge in Missile Defence. These experts are involved in the annual organisation of a Conference about this subject, as well as in several international events and position papers related to it. The 8<sup>th</sup> 3AF Missile Defence Conference took place from 3 to 6 July 2012 in Paris (at OECD), just a few weeks after the NATO Chicago Summit of 20 May in which Missile Defence was one of the key topics. It fulfilled the expectations and was a big success, with the involvement of near 300 delegates representing NATO and 16 countries (USA, Russia, E-U Nations, Israel, India).



Michel Scheller, President of the French Association for Aeronautics and Astronautics, during his introductory speech.



The members of the Conference opening session. From left to right: Yannick Devouassoux and Luc Dini (two Conference co-chairs assisting the 3AF President), Michel Scheller (3AF President), Jean Fournet (moderator), and the special guests speakers, IGA Patrick Auroy, Assistant Secretary General for Defence Investment, Robert Bell, NATO Secretary of Defence Rep. to Europe and Defence Advisor, US Ambassador to NATO, and Franck Rose, Deputy Assistant Secretary for Space and Defence Policy, US.



A view of the Conference room. Nearly 300 Delegates participated in the 3AF Missile Defence Conference in Paris on 3-6 July 2012.

### THE INTRODUCTORY SPEECH DELIVERED BY MICHEL SCHELLER, PRESIDENT OF THE 3AF:

MISSILE DEFENCE: A CHALLENGE FOR EUROPE WHERE A PROGRESSIVELY CAPACITY IS NEEDED TOGETHER WITH TECHNOLOGIES FOR THE FUTURE

[...] With a view to preparing the 8<sup>th</sup> 3AF Missile Defence Conference, the 3AF experts:

- Participated in the Russian Missile Defence Conference “Cooperation and Confrontation”;
- Represented the European industry at the NATO Missile Defence exhibit in Chicago (Raytheon represented the US industry);
- Produced a position paper called “Challenges of Missile Defence in Europe” intended for high ranking politics and officials in France.

Starting from the existing French Senate report “La Défense Antimissile Balistique” issued in 2011, our report outlined the main challenges for the European industry. It also provided a few recommendations on which capabilities to achieve in priority by 2020, on which technologies to invest into in order to preserve strategic and independent autonomy and to prepare future capabilities, and also for different opportunities for cooperation.

### TO ENHANCE THE NATO CAPABILITY

The objective is to enhance the NATO capability (see Note 1 and Annexes) by gradually completing the US EPAA (European Phased Adaptive Approach) with European assets. Interoperability is guaranteed by the NATO Command and Control Systems, whose developments should take in account European concerns (see Note 2 and Annexes). This way the NATO missile defence architecture will not only rely on US assets and technologies, which represent a very important effort, but also on the European systems and technologies, which are complementary and existing for some parts.

### NATO SHALL RELY ON THE US SYSTEMS BUT ALSO ON THE EUROPEAN SYSTEMS

These systems and technologies already play a valuable and progressive role in the NATO ALTBM (Active Layered Theatre Ballistic Missile Defence) architecture and will be a part of the future BMD expansion. This includes the surveillance and alert systems, C2 (Command and Control), and lower layer systems, with their surveillance/multifunction

**Note 1**

The NATO Secretary General, MR Rasmussen emphasized the consequence of the Nations decisions for the NATO Missile Defense capacity at the NATO summit in Chicago on May 25<sup>th</sup> 2012.

In summary:

Missile Defense is part of the NATO strategic concepts, combined to the nuclear deterrence , conventional capacity and defense...Missile Defense is complementary, as a defense, but cannot replace the Nuclear deterrence. The MD Interim capacity is there to provide a maximum protection with limited assets, to the NATO territory, populations and forces belonging to the European Mediterranean areas against a ballistic missiles attack. The purpose is to aim to a global protection of the territory and populations by welcoming national contributions including interceptors. Only the NATO Command and Control capacity resulting from the ALBMD C3 and expansion will be funded under Common funding. The radar stationed in Turkey is taken into account like other national contributions. NATO encourages additional Allies contributions including through multinational cooperation taking advantage of planning, development, acquisition and deployment.

**See Annexes for more information.**

**Note 2:**

Some of the European concerns were clearly adressed by the French President MR Hollande after the summit.

He expressed that France gave quitus to NATO to proceed for the Missile Defence Interim capability and expansion provided that several conditions are met:

- The Missile Defense is not a substitute to Nuclear Deterrence
- Missile Defense use is under political control, mainly through the BMC3 Rules Of Engagement (ROE) like for the Interim Capability
- Our industry is involved.
- The costs are under control in order to avoid costs increase which would be unbearable for the Alliance budget.

Countries must not feel being threatened by the Missile Defense, including Russia with which the dialog has to be maintained.

**See Annexes for more information.**

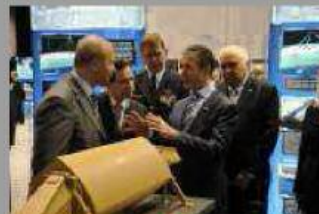
**Note 3: US and European Industry representatives with NATO Secretary General at the MD exhibit Inauguration, Chicago, 20 may 2012**

**3AF was representing the European industry and expressed to the SEcGen its view related to the European industry complementarity to the US industry**

- Our involvement into the NATO BMC3 and integration process along with the ALTBMD C3 expansion is essential.
- NATO shall give value to the European systems complementary of US systems
- European systems shall be also present in the crisis arcs countries where interoperability between EU and US assets will be ensured (export/ ROI stakes)
- Support NATO to take advantage of both US and European assets complementarity.
- European industry has a role to play in bilateral cooperation with Russia or other countries.



**US Industry-Raytheon**



**European Industry (3AF)**



radars and missiles, which are part of the paced capacity priorities as expressed the 3AF report for 2020. They also need to be exported like the US systems along the crisis arcs. This is essential for our investments into new capabilities for the transatlantic cooperation and start new cooperation (see Note 3).

At a time when the budgets become scarce for all, we all need to share the effort, use smartly the systems, and invest in the new technologies which are keys for the future. In order to prepare the improvement of systems and decision for new capabilities, we need to conduct R&D both on surveillance systems technologies and on the upper layer interceptor technologies, endoatmospheric and exoatmospheric: Kill Vehicle (KV) experiment is one theme.

To achieve this, more cooperation is required: in Europe and outside Europe, with a more balanced transatlantic cooperation, and with Russia if Government decision is made one day to proceed on specific subjects.

The next Conference is planned to take place in Bucharest (Romania) from 30 April to 3 May 2013. It will bring new information and debate on this continuing challenge for Europe and the European industry. We will be more than happy and honoured to welcome you on this occasion.”



Luc Dini, Co-Chairman of the 3AF Missile Defence Conference, is Business Development Missile Defence Director of Thales Air Systems SA.

## BALLISTIC MISSILES DETECTION

By Luc Dini

The detection of ballistic missiles is contributing to two kinds of missions:

- On the one hand, the **Early Warning** mission which consists of the monitoring of the ballistic trials from proliferating countries, and of the detection of the launch of an incoming ballistic missile towards the national territory or vital assets. The Early Warning then allows both to identify the aggressor and to provide alert to the targeted areas.
- On the other hand, as a **contribution to the Ballistic Missile Defence (BMD)**, the BMD detection will provide the kinematics and identification parameters of the incoming missiles to the surveillance and weapon assets, which are located downwards of the defence chain.

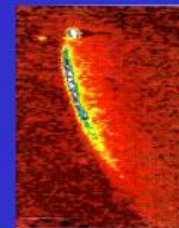
Indeed, the two sorts of detection systems exist: the detection systems based on infrared detection (mainly based on geostationary satellites) and radar with electronic beam forming antenna.

## SPACE BASED EARLY WARNING SYSTEMS

The space-based Early Warning systems are using an infra-

Figure 1 : Ballistic Missile and its plume

On the left, a ballistic missile with its boosters- On the right, a high resolution IR image of a ballistic missile Plume . If seen from a Geostationary orbit, the plume looks like a bright spot against the Earth background.



red sensor mounted on a geostationary satellite to detect the infrared radiation from the ballistic missile exhaust which are commonly called the “plume” (Figure 1) made of high temperatures (> 1000°C) gas resulting from the rocket combustion during the boost phase of the missile.

The detection is generally operated from the geostationary orbit by an infrared (IR) sensor that scans the Earth disk against which the missile detection is operated. This sensor is using specific IR frequencies or wavelengths associated to the absorption bands of the atmosphere (wavelength tuned to CO<sub>2</sub> and water vapour, constituents of the atmosphere). By looking through the atmosphere absorption windows, the noisy radiation coming from the Earth (Figure 1) is dramatically reduced and smoothed to enhance the contrast and the detection of the little hot spot generated by the missile plume, moving above the lower layers of the Earth atmosphere. The measurements operated by the sensor are 2D (angular) and allow through sophisticated algorithms to estimate the launching point, the missile kinematics and the aimed point, and possibly to estimate the identity of the missile (Scud missile for instance). The main advantage of the geostationary satellite is to offer a nearly hemispheric coverage of the Earth. In order to cover the whole Earth, several of them are necessary (a minimum of 3), knowing that looking with two satellites with a stereoscopic vision enhances not only the accuracy but also reduces the effects of glints coming from the Sun bright reflection on the clouds, that would be seen from one satellite but not from the other. Therefore, it reduces the “false alarms” coming from the sun rays on clouds. Nevertheless the ballistic missiles IR detection from a geostationary satellite is possible only during the boost phase which lasts a few tens of seconds, since the plume fades and disappears after boost.

Figure 2 : Detection of the missile and warhead by a radar

In example, depending on the ballistic missiles sophistication, the missile can be a single stage missile with a non separated warhead, or a multiple stages missile (see figure 1) with a single large separable warhead (on the left) or with several warheads (on the right). After the detection, the radar allows to scan the missile and its payload and provide information on the payload, the number of warheads, their trajectory,...all information useful for the BMD alert chain and for the monitoring of proliferation.



**Figure 3 : Long range EW radars and EW geostationary satellite**

On the left, two Russian Low frequency radars ( Gabala like old generation EW radar , several thousands of km in range, and the Voronezh new generation EW radar). In the middle , the BWES US radar and the US DSP EW satellite. On the right, the AN TPY2 X band radar, Thaad system fire control radar. This radar is also used as a forward based gap filler EW radar deployed in Turkey, to provide alert on missile launched from the South (US BMEWS are located and oriented North) to the US Aegis naval antimissile system fitted with the SM3 missile . Some AN-TPY2 radars are also stationed in Korea, Israel and Japan, for intelligence on North Korea and Iranian ballistic tests and scanning the launching areas.



Russian EW radars

US EW radar and EW DSP satellite

US AN TPY2 radar

**Figure 4 : Detection, alert and tracking by a medium range radars network**

On the left, the FPS5 "camera" Japanese radar is used as part of the radar early warning and tracking network. In the middle, the naval multifunction L band SMART-L radar or LRR radar, present on many European frigates. The Nederland have signed a contract with Thales to produce a more powerful version, SMART-L EWC, for the Ballistic Missile alert, and potentially to contribute to the antimissile SM3 engagement. On the right, the M3R S band antenna of the GS1000 radar class. This alert and tracking multifunction radar has been designed for the SAMP-T system to provide detection and long range tracking of TBMs. This radar can be used in parallel in a network to provide TBM situation to the NATO ACCS C3. On the right, the SAMP-T Arabel fire control system used against SRBMs and Air-breathing targets like cruise missiles.



FPS5 Japanese radar

SMART-L radar and European frigate

FR-ITS SAMP-T with Arabel radar

GS1000 radar detection/tracking radar

**Figure 5 : french projects – experimentations and demonstrators**

The Spirale experimentation included two micro satellites fitted with IR spectral imaging sensors (manufactured by ThalesAleniaSpace ) under Astrium system responsibility and DGA French MOD contract. This Spirale experimentation gave many high resolution pictures of the Earth IR background (see the image in the middle) to characterize the spatial noise of the Earth, on which the future EW satellite will operate the missile detection. On the right, the TLP very long range radar. A demonstrator (1/8 th antenna is under development to be delivered in 2014 by ONERA and Thales).



Spirale satellite

Earth Background Spirale image

Very Long Range radar

depends on the sensor sensitivity, on the FOV (Field of View), on the revisit time, ... , on the satellite longitude and communication constraints. For the radar, it depends on its geographic location, range and angular coverage and search rate. This coverage can be optimized.

For the satellite, the coverage can be improved by a compromise between the global area covered, the instantaneous Field of View/accuracy, the sensitivity and the false alarms rate.

For the radar, the detection area can however be maximized, either by choosing a low frequency powerful long range radar (UHF) which allows to reach several thousands of km, or by operating radars linked into a detection network belt, where the radar coverage are adding to each other. The radar beam can also be cued to the missile rough location by the satellite detection which helps to increase the radar range but also to suppress the false detections coming from the satellite by confirming or infirming the presence of the missile.

Furthermore, once the first detection is performed by the radar, the latter can track the missile during a long time, offering a long observation duration and accuracy, even after the booster burnt out. The radar can track indeed the missile in boost phase or the cold warhead during mid-course, when it follows a ballistic path.

**> Early Warning satellite and radar are therefore complementary.**

**THE ELECTRONIC BEAMFORMING RADARS**

Another way to detect a ballistic missile is to use electronic beam-forming radar, based on land or ship. The radar will scan the horizon in order to build a detection fence. Depending on the location of the radar towards the missile trajectory, and depending also on the radar range, the missile trajectory will cross the fence and rings the bell, during the missile boost phase or later, during mid-course, when the booster is burnt out. Whenever the missile and its warhead are within range of the radar, the beam will give a direct measurement of the missile position and speed, and will possibly give a "radar scan" of the payload (Figure 2). If we compare the radar and the geostationary satellite, we see that their geographic coverage are constrained by different parameters. For the satellite, the covered area

For decades, the USA and Russia (Figure 3) have developed and operated Early Warning satellites (Defence Support Programme – DSP -, then Space-Based IR System - SBIRS - for the USA) and low frequencies radars BMEWS radars, Large Phased Array – LPA – Soviet radars; Voronezh type Russian radars). These EW radars are fixed. Some US radars had been located in the northern part of Europe since the Cold War and oriented to look above the North Pole horizon to detect the incoming Soviet ICBMs flying inbound to the US continent. The USA have also recently deployed in Turkey a medium range radar called TPY2, to provide a detection capability against missiles that could be launched from the South. The Japanese made a choice to detect the ballistic missiles that could be launched from North Korea by using a



network of medium range ground based radars FPS3 (L and S band radars) and FPS5 (Figure 4) to provide the alert to the Patriot and SM3 Aegis systems. These radars are part of the evolution of the Japanese Air Defence System (JADGE) with Ballistic Missile Defence evolution (BADGE). The Europeans could also consider the use of medium range naval radars (1000 km class) like the Dutch SMART-L radar (Figure 4) which is operated in L band and is mounted on many European frigates. These radars could be used as part of a European surveillance network, to complete the US radar (AN TPY2 in Turkey) among other NATO systems.

France has decided to launch the “Spirale” experimentation in 2009 which already provided in orbit measurements of the IR Earth background (Figure 5). The design of the future French Early Warning system – EW satellite, Very long Range deployable EW radar “TLP” and Command & Control – have started by two industrial teams (Astrium and Thales) for a system to be progressively deployed in 2018 (radar) and 2020 (satellite). In the meantime, a “TLP” radar demonstrator is under development by ONERA (French Aerospace Research Agency – Office National d’Etudes et de Recherches Aérospatiales) and Thales, to be delivered in 2014.



## ANNEXES

Here below are reproduced some excerpts from the Declaration issued by the Heads of State and Government who participated in the meeting of the North Atlantic Council in Chicago on 20 May 2012, regarding the Missile Defence question.

[www.nato.int/cps/en/natolive/official\\_texts\\_87597.htm?mode=presserelase](http://www.nato.int/cps/en/natolive/official_texts_87597.htm?mode=presserelase)

## DETERRENCE AND POSTURE REVIEW

[...]

### IV. THE CONTRIBUTION OF MISSILE DEFENCE

18. The proliferation of ballistic missiles is a growing concern for the Alliance and constitutes an increasing threat to Alliance security. NATO’s ballistic missile defence capacity will be an important addition to the Alliance’s capabilities for deterrence and defence. It will strengthen our collective defence commitment against 21<sup>st</sup> century threats. In Lisbon, Allies agreed on a missile defence capability that provides full coverage and protection for all NATO European populations, territory and forces, against the threat posed by the proliferation of ballistic missiles, based on the principles of the indivisibility of Allied security and NATO solidarity, equitable sharing of risks and burdens, as well as reasonable challenge, taking into account the level of threat, affordability, and technical feasibility, and in accordance with the latest common threat assessments agreed by the Alliance. Missile defence will become

an integral part of the Alliance’s overall defence posture, further strengthen the transatlantic link, and contribute to the indivisible security of the Alliance.

19. In Chicago, Heads of State and Government announced that NATO has achieved an Interim Capability for its missile defence. The United States will contribute the European Phased Adaptive Approach to NATO missile defence. Alliance leaders also welcome decisions by individual Allies to contribute to the NATO missile defence mission, encourage calls for possible additional voluntary contributions by Allies, including through multinational cooperation, to provide relevant capabilities. The Alliance will continue to implement the commitment made in the Lisbon package of the Alliance’s most pressing capability needs to build a truly interoperable NATO missile defence capability based on the Active Layered Theatre Ballistic Missile Defence command and control network as the enabling backbone.

20. Missile defence can complement the role of nuclear weapons in deterrence; it cannot substitute for them. This capability is purely defensive and is being established in the light of threats from outside the Euro-Atlantic area. It is expected that NATO’s missile defence capabilities would complicate an adversary’s planning, and provide damage mitigation. Effective missile defence could also provide valuable decision space in times of crisis. Like other weapons systems, missile defence capabilities cannot promise complete and enduring effectiveness. NATO missile defence capability, along with effective nuclear and conventional forces, will signal our determination to deter and defend against any threat from outside the Euro-Atlantic area to the safety and security of our populations.

21. NATO missile defence is not oriented against Russia nor does it have the capability to undermine Russia’s strategic deterrent. The Alliance, in a spirit of reciprocity, maximum transparency and mutual confidence, will actively seek cooperation on missile defence with Russia and, in accordance with NATO’s policy of engagement with third states on ballistic missile defence, engage with other relevant states, to be decided on a case-by-case basis.

### GENERAL DECLARATION FROM HEADS OF STATE AND GOVERNMENT

[...]

59. Missile defence can complement the role of nuclear weapons in deterrence; it cannot substitute for them. This capability is purely defensive.

60. We are pleased today to declare that the Alliance has achieved an Interim NATO BMD Capability. It will provide with immediate effect an operationally significant first step, consistent with our Lisbon decision, offering the maximum coverage within available means, to defend our populations, territory and forces across southern NATO Europe against a ballistic missile attack. Our aim remains to provide the Alliance with a NATO operational BMD that can provide full coverage and protection for all NATO European

populations, territory and forces, based on voluntary national contributions, including nationally funded interceptors and sensors, hosting arrangements, and on the expansion of the Active Layered Theatre Ballistic Missile Defence (ALTBMD) capability. Only the command and control systems of ALTBMD and their expansion to territorial defence are eligible for common funding. Within the context of the NATO BMD capability, Turkey hosts a forward-based early-warning radar. We note the potential opportunities for cooperation on missile defence, and encourage Allies to explore possible additional voluntary contributions, including through multinational cooperation, to provide relevant capabilities, as well as to use potential synergies in planning, development, procurement, and deployment.

61. As with all of NATO's operations, full political control by Allies over military actions undertaken pursuant to this Interim Capability will be ensured. Given the short flight times of ballistic missiles, the Council agrees the pre-arranged command and control rules and procedures including to take into account the consequences of intercept compatible with coverage and protection requirements. We have tasked the Council to regularly review the implementation of the NATO BMD capability, including before the Foreign and Defence Ministers' meetings, and prepare a comprehensive report on progress and issues to be addressed for its future development, for us by our next Summit.

62. The Alliance remains prepared to engage with third states, on a case by case basis, to enhance transparency and confidence and to increase ballistic missile defence effectiveness. Given our shared security interests with Russia, we remain committed to cooperation on missile defence in the spirit of mutual trust and reciprocity, such as the recent NRC Theatre Missile Defence Exercise. Through ongoing efforts in the NATO-Russia Council, we seek to determine how independent NATO and Russian missile defence systems can work together to enhance European security. We look forward to establishing the proposed joint NATO-Russia Missile Data Fusion Centre and the joint Planning Operations Centre to cooperate on missile defence. We propose to develop a transparency regime based upon a regular exchange of information about the current respective missile defence capabilities of NATO and Russia. Such concrete missile defence cooperation is the best means to provide Russia with the assurances it seeks regarding NATO's missile defence plans and capabilities. In this regard, we today reaffirm that the NATO missile defence in Europe will not undermine strategic stability. NATO missile defence is not directed against Russia and will not undermine Russia's strategic deterrence capabilities. NATO missile defence is intended to defend against potential threats emanating from outside the Euro-Atlantic area. While regretting recurrent Russian statements on possible measures directed against NATO's missile defence system, we welcome Russia's willingness to continue dialogue with the purpose of finding an agreement on the future framework for missile defence cooperation.

63. We remain committed to conventional arms control. NATO CFE Allies recall that the decisions taken in November 2011 to cease implementing certain CFE obligations with regard to the Russian Federation are reversible, should the Russian Federation return to full implementation. NATO CFE Allies continue to implement fully their CFE obligations with respect to all other CFE States Parties. Allies are determined to preserve, strengthen and modernise the conventional arms control regime in Europe, based on key principles and commitments, and continue to explore ideas to this end.

## FRENCH PRESIDENT François HOLLANDE DECLARATION

### La position française sur le bouclier anti-missiles.

Extrait relatif à la déclaration de François Hollande à l'issue du sommet de Chicago.

« Les 4 conditions posées par la France:

François Hollande, comme auparavant son ministre des Affaires étrangères, Laurent Fabius, ont repris à Chicago, à leur compte certaines des préventions françaises. Le Président de la République a ainsi résumé, dimanche en fin d'après midi (heure de Chicago), les quatre conditions posées par la France : 1° La défense anti-missiles « ne peut pas être un substitut à la dissuasion nucléaire mais un complément » (NB : une tradition française qui figure dans la déclaration adoptée) ; 2° il doit y avoir un « contrôle politique de son utilisation. Nous aurons y à travailler » (NB : il s'agit essentiellement des règles d'engagement qui ont été approuvées pour la capacité intérimaire avant la réunion) ; 3° il importe que « nos industriels soient directement intéressés » ; 4° il doit y avoir une « maîtrise des coûts pour qu'il y ait pas une dérive financière qui serait insupportable pour le budget de l'Alliance ».

### La France donne son quitus au bouclier anti-missiles

François Hollande a ajouté un cinquième principe : « Il ne peut pas être question que des pays se sentent menacés par cet dispositif anti-missiles, je pense notamment à la Russie. Le dialogue avec la Russie doit donc être maintenu ». Et de conclure « Sur ces 4 conditions, le communiqué final nous donne satisfaction ».



# THE FUTURE OF UK DEFENCE AEROSPACE - A SOCIETY DISCUSSION PAPER

By Tim Robinson

**Executive summary of now available high-level discussion paper on the future of the UK military aerospace sector.**



What else apart from Taranis? (BAE Systems)

“The Royal Aeronautical Society believes that there should be a national debate about future of the UK Defence Aerospace Industry. Last June I hosted a conference on the subject which featured some very significant contributions from across the aerospace community. The discussion paper that resulted from this conference is intended to move the debate forward. Edited by Professor Keith Hayward, the Society’s Head of Research, with major contributions from several Society Fellows and Specialist Groups, the full paper is available on the Society’s website, a summary is provided below and copies are being sent to key stakeholders. We believe that the recommendations in the paper are well-founded, but we recognise that there may be other views out there; in which case we would like to hear them. Please contribute to the debate by writing to the Editor. In any event, we intend to hold a forum on the subject later this year to see how far the debate has progressed”.

Phil Boyle, President

## SUMMARY

The government has widely advertised its support for UK aerospace as a core manufacturing asset. It has backed its words with financial support for civil aeronautics and space. However, Britain’s military aerospace sector faces a more uncertain future. There is no doubting the importance of airpower to the security of the UK, nor the value on an on shore industry capable of supporting British armed forces. Military aerospace also provide the bulk of UK military export sales. But the government’s public statements on the defence industrial base, including aerospace have been vague and ambiguous. Indeed, some of the policies pursued by the UK Ministry of Defence (MoD) have tended to work contrary to the interests of an indigenous military aerospace industry.

The nature of the long term threat to capability is subtle, yet fundamental. On the one hand, sales of the Typhoon and

other current products, as well as the promise of substantial production returns from participation in the F-35 Joint Strike Fighter, should offer a substantial return to British companies supporting thousands of jobs all over the country. On the other hand, there is risk to future high value business, the ‘noble’ work contained in the deep and wide body of aerospace knowledge built up over several decades. This body of knowledge comprises such complex skills as systems integration, advanced propulsion systems, avionics other electronics technologies; Indeed, the latter is now often a valuable element of overseas sales via incorporation in other national aerospace programmes.

It represents the fundamental Intellectual Property (IP) that allows UK industry to fulfil urgent operational requirements, a degree of independence and security of supply, long term support for deployed equipment and a core contribution to national economic welfare. This feeds a manufacturing supply chain from internationally operating prime contractors to a myriad of smaller companies, and enables the UK to maintain safely an open, globalised approach to defence that has benefited the MoD and British industry. Should this nationally generated IP begin seriously to diminish, all of these benefits will rapidly disappear.

The Society believes that this is indeed the case. The UK cannot entirely rely on the production of overseas designed equipment, or on the technology, important though it is, of novel concepts such as unmanned aerospace systems. There is a need to support core technologies, especially in avionics and electronics; this may be best achieved through a programme of technology demonstration.

The UK must also continue to exploit the advantages of international collaboration with European and American partners. But the key consideration must again be the level of technological return delivered by cooperation. This may still be best achieved through working in more egalitarian collaboration with European partners. However, mindful of past mistakes and the economic limitations of many European collaborative programmes, future joint ventures must be soundly based and managed through strong central structures.

But in order to participate at the highest level in international programmes and to ensure the greatest return for the UK, UK companies must be able to offer state-of-the-art technology and process capabilities. This again will depend upon investment in domestic technology.

There is a strong security and economic case for supporting the UK military aerospace industry; domestic procurement policies should not unreasonably increase the slope of the competitive playing field. Support does not necessa-



rily include, desirable though in principle this might be, commitment to expensive new platforms. In the future, large new aerospace platforms will be increasingly rare (although upgrades, consequently, will be required), but it is vital that UK systems integrators for airframes, sensors and propulsion remain in a position to assume leading roles in international programmes. To do so requires a concerted strategic investment in underpinning technologies, particularly in the electronics and avionics sectors. These are the building blocks of future capability and export success, whether in indigenous programmes or sold into overseas platforms. If the Government changes course in the manner we recommend, it will help to retain core manufacturing skills and the focus for academic and other research activity.

There is a world class body of knowledge embedded in the UK military aerospace industry, which should be defended and nurtured. It is an investment for the future that will reap rich rewards in military effectiveness, economic success and political influence. Defence aerospace is a fundamental component of UK manufacturing success; producing high value goods and related services will generate future national income and underpin the country's ability to sustain a high standard of life and deliver first rate public services.

It is recommended that:

That in a complex and challenging world, the government must recognise that effective air power capability is an

essential component of defence and security and that the essential foundation for this capability is a strong on-shore military aerospace industry backed by a coherent technology programme.

That the government should recognise that a strong base of UK defence intellectual property is the crucial enabler for the independent development of defence systems. That UK defence intellectual property and advanced manufacturing capability have been developed over decades and, if lost, will take decades to regain. Similarly, unless the UK defence industrial foundation is maintained then the potential for defence exports will be critically weakened.

The Government should recognise that the focus on subsystems rather than the design, development and production of complete aircraft significantly limits the capability of UK defence industry. This will be especially marked with the end of Typhoon production by 2017 and that JSF involvement will take UK fast jet production offshore and that the extent of UK access to core technology may not ensure our involvement in future high value upgrade work.

The UK retains strong links with European neighbours in order to retain core technological competencies. Joint programmes should be sought with both US and European partners but policies should be formulated in the knowledge that collaboration with the latter is likely to have greater technological benefits.

It will be vital that UK systems integrators for airframes, sensors and propulsion remain able to take leading roles in international programmes. This requires a concerted strategic investment in underpinning technologies.

## THE ESA COUNCIL AT MINISTERIAL LEVEL ON 20-21 NOVEMBER IN NAPLES

**On 21 November 2012, ESA concluded a successful two-day Council meeting at ministerial level in Naples, Italy. Ministers from ESA's twenty Member States and Canada allocated €10 billion for ESA's space activities and programmes for the coming years.**

### SEVERAL OBSERVERS WERE ALSO PRESENT



ESA Council at Ministerial Level, Naples, 20 November 2012

Apart from the 20 ESA Member States and Canada, several observers were also present: 8 out of the 9 EU Member States not yet Member States of ESA (Bulgaria, Estonia,

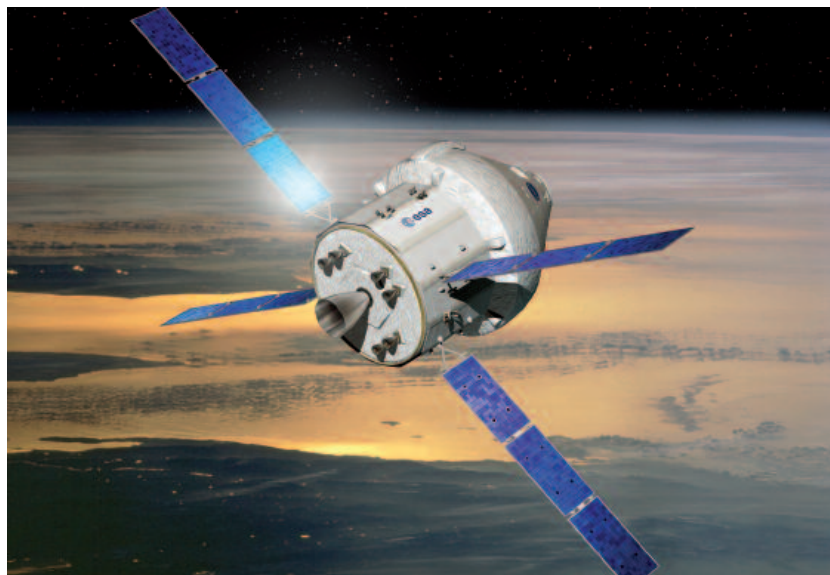
Hungary, Cyprus, Latvia, Lithuania, the Slovak Republic and Malta), the European Commission, EUMETSAT, the European Science Foundation, the European Defence Agency (EDA), the European Maritime Safety Agency (EMSA), the European GNSS Agency (EGA) and the Organisation for Economic Co-operation and Development (OECD).

### TELECOMMUNICATIONS, METEOROLOGY, EARTH OBSERVATION, ISS

Ministers focused the investments on fields with high growth potential or with a direct and immediate impact on the economy such as telecommunications and meteorology. They approved ESA's level of resources for 2013-2017, the proposals for Earth Observation and confirmed Europe's commitment for the exploitation of the International Space Station (ISS).

### ARIANE 5 ME AND ARIANE 6

Replacement of the Ariane 5 rocket was the major theme of the Ministerial Conference. The ESA proposes that Ariane 6, its successor, is designed to launch a single satel-



Proposal for a Multi-Purpose crew Vehicle-Service Module (MPCV-SM).  
Credits: ESA-D. Ducros, 2012

lite in geostationary orbit, which would give greater operational flexibility. The concept of dual launch would be abandoned to focus on the single charge placement in geostationary orbit. Ariane 6 could also orbit payloads of small size with capacity similar to the Russian Soyuz rocket.

A second scenario was envisaged: the medium term development of the upper floor used by a new version of Ariane 5: this is "Ariane 5 ME", which with a new Vinci engine, would be capable of launching a greater payload (11.2 tonnes in GTO), so performing more complex missions. In this scenario the development of Ariane 6 would be postponed to a later date.

Ministers secured investments for the detailed definition studies of the new launcher ARIANE 6 and the continuation of ARIANE 5 ME adapted, with the goal to develop as many commonalities as possible between the two launchers. These activities are funded for two years with a decision on the continuation of both launchers to be taken in 2014.

## ORION

Ministers gave the green light for Europe to provide the service module of NASA's new Orion Multipurpose Crew Vehicle ("Orion" MPCV) as an in-kind contribution for ISS operations for 2017-2020. This decision is strategically important for Europe as it will enable co-operation between ESA and NASA on the future human space transportation system.

## TO BEST SERVE EUROPE

Ministers approved a Political Declaration towards the ESA that best serves Europe, initiating a process for the further evolution of ESA. The objective is to capitalise on the competence and the achievements of ESA while taking full benefit of EU policies, in other words, to define how ESA can adapt its operations to take benefit of both, its intergovernmental framework and the EU competence in space. They have also stated their willingness to ensure coordination and coherence between the process initiated on the ESA side and the one initiated on EU side. This Political Declaration was also supported by Ministers from 7 of the

EU Member States not yet members of ESA, present at the meeting.

## FOUR ADOPTED RESOLUTIONS

Ministers adopted four Resolutions:

1. "On the role of ESA in sustaining competitiveness and growth" political and programmatic highlights of the Council.
2. "Level of resources for the Agency's Mandatory Activities 2013-2017" which cover science programme and basic activities.
3. The renewal of the contribution of ESA Member States to the running costs of the Guiana Space Centre.
4. The "Political Declaration towards the European Space Agency best serves Europe".

*J.-P. S. Article written on the basis of information provided by ESA.*  
For further information, please contact ESA Media Relations office: [media@esa.int](mailto:media@esa.int)



Proposal for an Adapted Ariane 5 ME, on the left, and proposal for the Ariane 6, on the right.  
Credits: ESA-D. Ducros, 2012

## ESA-NASA COOPERATION AT MARS IS A CONTINUING SUCCESS

### 26 NOVEMBER 2012: FOSTERING CURIOSITY, MARS EXPRESS RELAYS ROCKY IMAGES

**For the first time, ESA's mars orbiter has relayed scientific data from "Curiosity".**

The data included detailed images of 'Rocknest3' and were received by ESA's deep-space antenna in Australia. It was a small but significant step in interplanetary cooperation between space agencies.

Early on the morning of 6 October, ESA's Mars Express looked down as it orbited the planet, lining up its lander communication antenna to point at Curiosity far below on the surface.

For 15 minutes, the NASA rover transmitted scientific data up to the ESA satellite. A few hours later, Mars Express slewed to point its high-gain antenna towards Earth and began downlinking the precious information to the European Space Operations Centre in Darmstadt, Germany, via the Agency's 35 m-diameter antenna in New Norcia, Australia. The data were immediately made available to NASA's Jet Propulsion Laboratory in California for processing and analysis, proving again that NASA's amazing new rover can talk with Europe's veteran Mars orbiter.

#### 1. Curiosity's ChemCam Images Rocknest3

The information included a pair of tremendously interesting images acquired on 4 October by Curiosity's ChemCam Remote Micro-Imager camera. ChemCam comprises the camera together with a Laser-Induced Breakdown Spectrometer, which fires a laser at targets and analyses the chemical composition of the vaporised material.

The laser zaps areas smaller than 1 mm across on the surface of martian rocks and soils, and then the spectrometer provides information on the minerals and microstructures in the rocks.

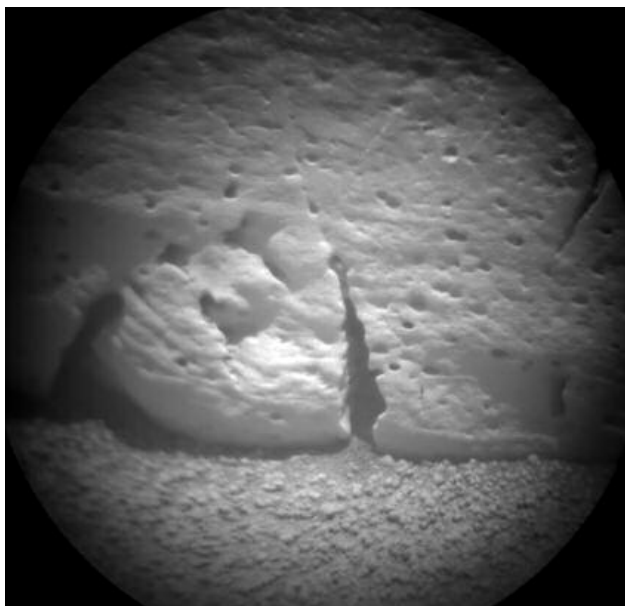


Figure 1. Rocknest3 relayed by Mars Express

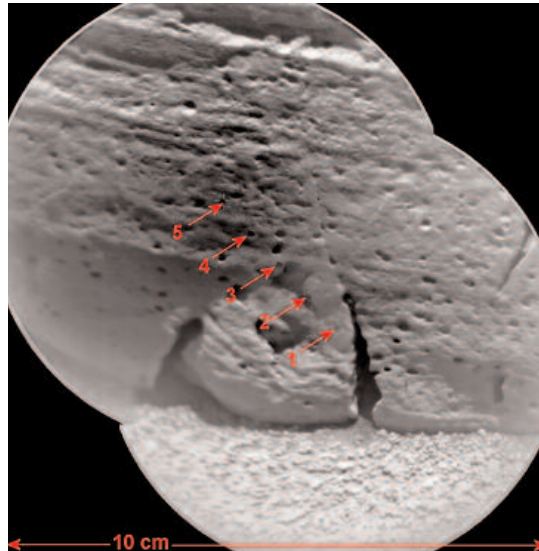


Figure 2. Rocknest3 relayed by Mars Express

#### Outstanding image quality

The first image (Figure 1) was taken before a series of 5 ChemCam laser blasts and the second image (Figure 2) was taken after. The image is centred on the fifth observation point.

"The quality of these images from ChemCam is outstanding, and the mosaic image of the spectrometer analyses has been essential for scientific interpretation of the data," says Sylvestre Maurice, Deputy Principal Investigator for ChemCam at France's Research Institute in Astrophysics and Planetology (IRAP).

"This combination of imaging and analysis has demonstrated its potential for future missions.

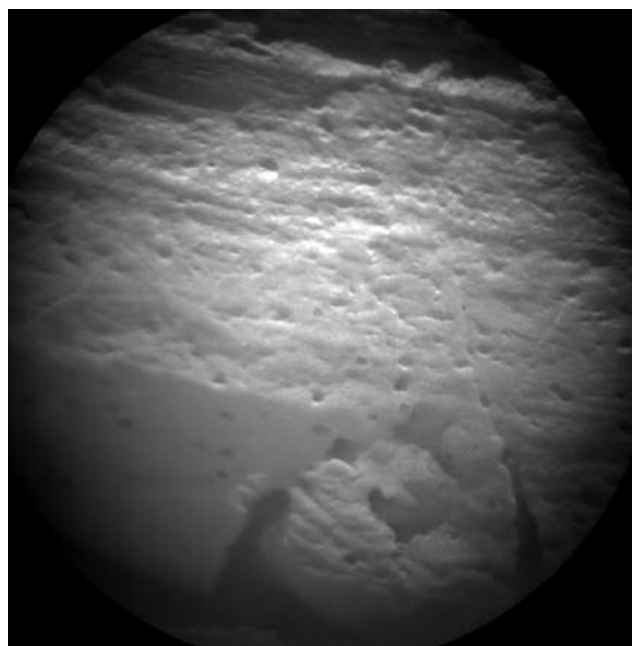


Figure 3. Laser targets on Rocknest3



## 2. ChemCam laser targets

A third image (Figure 3), relayed separately by NASA, indicates the locations of the laser target points on Rocknest3, as seen by the RMI camera.

'Rocknest' is the area where Curiosity stopped for a month to perform its first mobile laboratory analyses on soil scooped from a small sand dune. Rocknest3 was a convenient nearby target where ChemCam made more than 30 observations using 1500 laser shots. A wide-angle context image was acquired by Curiosity's MastCam and shows Rocknest3 as targeted by ChemCam. Rocknest3 is about 10 x 40 cm, or roughly the size of a shoe box.

## 3. Fostering Curiosity – and others

ESA's Mars orbiter has also relayed data for NASA's other surface missions – Phoenix, Spirit and Opportunity – since 2004, and it relayed Curiosity's radio signal during its arrival at Mars last August.

During the Curiosity mission, Mars Express is set to provide additional relay slots, while maintaining its own scien-

tific observation programme, under an ESA-NASA support agreement.

It can also rapidly provide relay services in case of unavailability of NASA's own relay orbiter or if there is a problem on the rover itself..

## 4. Interplanetary cooperation

ESA-NASA cooperation at Mars is a continuing success, and comes after both sides have worked diligently for a number of years to set technical and engineering standards to enable sharing data between spacecraft, networks and ground stations," says Mars Express Spacecraft Operations Manager Michel Denis.

"Exploring Mars is a huge challenge, and space agencies are working to boost cooperation and mutual support for current and upcoming missions. It's the way of the future.

From information data provided by ESA  
[www.esa.int/esaCP/SEMZTZB1W9H\\_index\\_0.html](http://www.esa.int/esaCP/SEMZTZB1W9H_index_0.html)

# 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 – aircraft – air force bases – airlines – airports – airworthiness/certification – astronauts – ATM/ATC – automation – avionics – business aviation – careers – clean sky – combat aircraft – commercial aviation – communication satellites – crew/pilots – Earth observation – economics/finance – education and training – electronics/software – engineering – environment –

exhibition – flight mechanics – flight simulation – Galileo – general - general aviation – GMES – GNC – green aviation – ISS – human factors – launchers – launching centres – manned space flights – manufacturing/design – materials – mechanisms/structures – medicine – meteorology – military transport – missiles – modelling – MRO – propulsion – public policy – quality/reliability – research & TD – rotorcraft – safety – science – security – SESAR – space vehicles – strategy – system studies – technology – testing – UAV/UCAV/UVS – weapon systems.

## 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 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 4th CEAS European Air & Space Conference and  
FTF Congress: Flygteknik 2013

Linköping, Sweden

16 - 20 September 2013




**Invitation & Call for Papers**



Linköping University

**Conference Language**  
The official conference language will be English.

**Submission of Abstracts**  
Authors are invited to submit extended 3 page abstracts for full papers, or one page abstract for oral only presentations, before **February 15, 2013**.

Notification by **15th April 2013**  
Full paper by **1st August 2013**

All documents shall be in PDF-format.

**Further Information**  
Further information about the conference;  
<http://www.ceas2013.org>

Pages will be updated regularly.



**Contacts** ceas2013@iei.liu.se

**Euro GNC 2013 – 2nd CEAS Specialist Conference on Guidance, Navigation & Control**


10 april 2013 | - 12 april 2012  
plaats: TU Delft, Delft, Netherlands  
door Webredactie



The CEAS EuroGNC Conference aims to promote scientific and technical excellence in the fields of Guidance, Navigation and Control (GNC) in aerospace. The European Aerospace GNC Conference 2013 will serve as a platform for communication and information exchange between specialists in these fields.

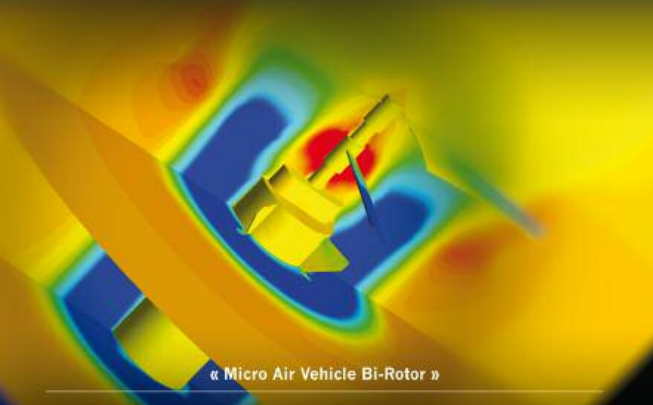
Scientists and engineers from industry, research institutes and universities involved in the development of novel GNC methods, applications or technologies are invited to attend the second EuroGNC Conference. Presentations should primarily be focused on technical and scientific aspects of GNC architectures, algorithms and methods as well as on actual experience gained from real-life applications in those fields.

As the European countries host a large community of scientists and engineers working in the many fields of aerospace GNC, the motive behind this international conference is to stimulate synergy among these fields. To ensure scientific depth and a technological orientation, submission of papers of managerial nature such as project descriptions, strategies or plans is not encouraged.



**48<sup>th</sup> International Symposium of Applied Aerodynamics**  
**Aerodynamics of small bodies and details**  
Saint-Louis, France - March 25-26-27, 2013

[www.3af-aerodynamics2013.com](http://www.3af-aerodynamics2013.com)



« Micro Air Vehicle Bi-Rotor »

