



## Editorial

### THE NEW CEAS : AN HOPEFUL DEPARTURE !

It was my great honour to have been elected as the President of the Council of European Aerospace Societies at the turn of last year.

Most importantly, I am sure that all would agree that the official formation of the Council is a major step forward for greater co-operation in one of Europe's leading industries and without doubt one where Europe is a world leader in many aspects of the Science, Engineering and Technology of Aeronautics and Astronautics.

However, it would be remiss of me to not pay particular thanks to Julián Simón CALERO, our outgoing President, for his tremendous work in steering the eight founding members of the Council through the complex corporate governance issues attached to establishing the Council.

The Council's objectives are clear and our prime aim must be to seek greater coordination of views and actions within Europe, and build on our strengths to enable us to operate more effectively as a global player.

I say this with a particular eye towards coordination in the vexed sphere of Research and Development where collectively we can have a major impact and certainly work successfully in conjunction with emerging players.

That said, two objectives are already in place even at this early stage. Firstly, we set up both the Space and Aeronautics Branches from the 1st January 2007 and secondly, the Berlin Conference on Aerospace and Space Technologies in September this year is being arranged by the DGLR.

Once again, it is my great honour and privilege to be your President and I look forward to working with the members of all the Societies to set us on a successful road.

Sir Colin TERRY  
President of CEAS




Sir Colin TERRY

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**BIOGRAPHY OF SIR COLIN TERRY :**

Sir Colin is a Chartered Engineer and was Chairman of the Engineering Council UK (ECUK) and was also a Board Member of the Engineering Technology Board (ETB). He became Chairman of Meggitt plc in July 2004 and is an advisor to several international aerospace companies. Latterly, he was Group MD of Inflite Engineering Services Ltd at Stansted. Prior to that, he had a long career in the Royal Air Force, attaining the rank of Air Marshal and Chief Engineer (RAF), Head of Logistics and Commander in Chief of Logistics Command.

Sir Colin has been an RAeS Council Member since 1999 and Fellow since 1994. He was educated in Bridgnorth Grammar School in Shropshire and the Royal Air Force Colleges of Henlow, Cranwell, Bracknell and RCDS. Sir Colin has an Honours Degree from Imperial College in Aeronautical Engineering. He holds a current PPL and, having trained as a military pilot, he has been a Flying Officer in the RAF VT(T) on an Air Experience Flight since 1999 and has flown cadets since 1986. Appointed a KBE and CB (and awarded the OBE for service in the Falklands).

**THE WORD OF THE CEAS  
EXECUTIVE DIRECTOR**



**Dieter SCHMITT**  
CEAS Director

I have been aware of CEAS for more than 10 years. Since the end of the nineties, I have been a member of the CEAS Technical Committee on “Air Transport” and this committee had organized several conferences at a European level about Airport Capacity needs, Air Transport safety aspects and Air Cargo in Europe etc. But these Technical committees and their successes were very much depending on personal commitments and the engagement of individuals.

CEAS at this time has not managed to become an institution at a European level, following the European integration of Industry, Research centers and Universities in the Aerospace sector.

With the formal commitment to establish a legal entity, there is an opportunity to give CEAS the support it needs to play an adequate role in the European Aerospace Community.

The strength of CEAS will be to have several Technical Committees in all major disciplines. We have to try to get the leading scientists and industry representatives to be a member of these Technical Committees (TCs), organize conferences and Workshops, issue technical position papers, support all National and European authorities and agencies with the technical information ; they need to set up their political and technical research programme.

It will take some time to set up the Technical Committees and get the acceptance from the best heads in Europe to contribute to their success. My vision is, that it should be the personal ambition and aim of each top level engineer from Aerospace to try to become a member of these TCs. It should be a personal honour to serve on the TCs.

The first activities in my role as CEAS Director will be to open an office in Brussels and set up the financial business plan for 2007, which looks difficult with the small budget available. So we will have to look to get a financial support from other bodies (industry, European Commission, etc.)

A sound financial situation and a well established office is mandatory to start an undertaking like CEAS. Together with the Heads of Branches (Space and Aeronautics) , we will setup the Technical Committees, nominate the Chairmen and Vice-Chairmen and start the TCs. In an optimistic view, the TCs should be established and working at the end of 2007 and provide already first reports in their technical field of competence. My personal background includes 30 years experience in the Airbus system in different sectors. My final position was Vice President of Research and Technology at Airbus Headquarters in Toulouse. In between, I have worked for 7 years as a Professor for Aeronautical Engineering at the Technische Hochschule München and have been involved in European projects like EASN and PEGASUS, initiatives from the Technical Universities to strengthen their European profile. I hope I can bring my European knowledge to help CEAS in the starting phase, to become a truly European Council, which it needs to be in a similar position like AIAA in the USA. I have seen Airbus growing from a nobody in the 70s to a global leader in Aircraft Manufacturing. Let’s try to start at a European level and install the necessary processes and working structure to develop the CEAS, fully respecting the national basis and existing Aerospace Societies, but promoting strongly the European added value.



## THE FIRST CEAS TRUSTEE BOARD MEETING

was held on 6 december in Brussels



From left to right: D. SCHMITT, U. OLSSON, J.-M. CONTANT, Sir Colin TERRY, J. SIMÓN CALERO

### Welcome

- The acting CEAS president, Julián SIMÓN CALERO, opened the meeting and welcomed the trustees for the 1st trustee board meeting of CEAS.
- Sir Colin TERRY was nominated unanimously by all trustees present as 1<sup>st</sup> president of CEAS.
- As Vice Presidents the following 3 candidates were proposed and were elected unanimously :
  - Jean-Michel CONTANT (VP, Publications and External Relations) ;
  - Julián SIMÓN CALERO (VP, Finance) ;
  - Ulf OLSSON (VP, Awards and Memberships).

### Branch Chairs and Directors endorsement

- Unfortunately, the 2 Branch Chairs could not join the meeting.
- Dieter SCHMITT (Airbus) presented the apologies from Alain GARCIA, who had other binding commitments but confirmed that Alain Garcia is willing to take over the responsibility as Head of the Aeronautics Branch.
- Wilhelm KORDULLA (ESA) confirmed that Constantinos STAVRINIDIS is willing to take over the responsibility as Head of the Space Branch.
- Dieter SCHMITT confirmed his willingness to act as CEAS Director.

In addition, the following were also appointed :

- Gérard FOUILLOUX, Head of the Programme Coordination Committee (PCC) ;
- Jean-Pierre SANFOURCHE, Editor-in-Chief of the CEAS Quarterly Bulletin.

### About the Committees

• The CEAS Director reported that a first set of Technical Committees had been agreed between the heads of Branches :

**Aeronautics** : • Air transport systems • Aircraft design • Aeroacoustics • Passenger systems • Fluid dynamics • Avionics – Flight Control and guidance • Structures and Materials • Propulsion • On-board Energy.

**Space** : • Aerothermodynamics • Propulsion • Structures • Thermal • Mechanisms • Environment Control And Life Support (ECLS) • Guidance and Navigation Control (GNC) • Power • Mission Design and Space Systems.

Each technical committee has the mandate of promoting research and development in its field. It will make use of several instruments and media, such as the organisation of thematic workshops and symposia, promoting and facilitating the publication of articles in technical journals, and the preparation of position papers. It will maintain a strong link with the European industry as well as the European Universities and Research Institutes, with a view to promoting the awareness of advanced developments among future professionals and facilitating the contacts between industry and academia. Furthermore, each Technical Committee will act as a reference for contacts with Technical Committees of other international professional associations outside Europe.

Over the next 2-3 years, a better integration of Aeronautics and Space TCs might be envisaged, but a pragmatic approach is needed to start quickly confirming the basic 22 TCs.

• In addition to the Technical Committee, it is also foreseen to set up some **General Committees** common to both branches : • students, education and training • public relations • history.

### About publications

The format of the new CEAS Quarterly Bulletin presented by Jean-Pierre SANFOURCHE was agreed : the number 1-2007 is the present issue.

– Concerning the Technical Journals, preliminary discussions with DLR/ONERA are needed in order to examine possible opportunities of co-operation.

### About the CEAS Website

AIAE as acting webmaster has recently up-dated the CEAS webpage to reflect the latest changes in CEAS. But a complete re-arrangement of CEAS webpage should be prepared and the lead will be under the responsibility of the CEAS Director. For the next few months the CEAS webpage should continue under AIAE responsibility until the new CEAS infrastructure and office in Brussels are established. The CEAS Director is prepared to define the new CEAS office in Brussels but for budget reasons, the change should be carefully prepared.

## About the basic actions to be conducted in the first half of 2007

- Branch membership to be started as soon as possible in each corporate member society : the subscription is free of charge for the year 2007.
- To actively and carefully manage the call for papers for the first CEAS conference, Berlin 10-13 September, in order to obtain high standing papers in all disciplines, well balanced between the different member societies.
- The CEAS presence at Le Bourget Airshow to be organised and successfully implemented.
- Publication process to be started.
- Strategic plan and business plan to be established.
- Adhesion of new members to be studied : Greece, Finland, Poland.
- CEAS adhesion to international organisations to be studied : ICAS, IAF.

## Next meetings

The following dates have been agreed :

- 07<sup>th</sup> of March at ESA/ESTEC, Noordwijk, Netherlands.
- 20<sup>th</sup> of June in Le Bourget (during the Airshow)
- 10<sup>th</sup> of Sept. in Berlin, Hotel Estrel, 1<sup>st</sup> Ceas Conference
- November, London, at RAeS (exact date still to be fixed).

## Conclusion

The president outlined his way of working :

- use of emails as communication means ;
- send out all reports 1 week prior to the Board meeting ;
- openness and fairness spirit to bring maximum value to CEAS.

J.-P. SANFOURCHE

From informations given by D. SCHMITT



## Century perspectives .The first CEAS Air & Space Conference

The focus of the presentations shall be on the following five goals for the Congress:

- **Access to space and future space utilization,**
- **Innovative concepts for future air transport,**
- **Environment and technologies for environmental aspects in aeronautics and space,**
- **International cooperation among academia, research and industry,**
- **Education and training for aeronautics and space; attracting young engineers.**

Each author shall present his paper orally (15 minutes plus 5 minutes for discussion). Posters (Din A1/A0) shall be presented in an exhibi-

tion and in a dedicated Poster Session, in which the authors have the opportunity for an oral presentation (5 minutes).

## Deadline for receipt of abstracts: April 13<sup>th</sup>, 2007

Prospective authors are invited to submit papers or posters electronically using the online abstract submission form. In case of questions please mail to [CEAS@dglr.de](mailto:CEAS@dglr.de). Selection of papers and posters will be based on the submitted abstracts based on following criteria: scientific/technical relevance, actuality, reference to the Congress' motto and goals. Authors will be informed about the acceptance of their contribution by **May 24<sup>th</sup>, 2007.**

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# PERSONALITY INTERVIEW

## > Alain Garcia

J.-P. SANFOURCHE, Editor-in-Chief of the CEAS Quarterly Bulletin interviewed Alain Garcia



*Alain Garcia, executive Vice-President, Eng., Airbus, is Head of the CEAS Aeronautics Branch.*

### CEAS bulletin

The Council of European Aerospace Societies was publicly launched on the occasion of the Aeronautics Days, Wien, 19-21 June 2006. What are, in your opinion, the main goals towards which the efforts of this new institution should be directed ?

### Alain Garcia

Let me take an example : the AIRBUS building story. This is because we have been able in Europe, to progressively put together under the same umbrella, then the same house, the national proficiencies and expertises in aeronautics, that we have been able by sheer forces of cooperative work, to develop the best products on world level. So, the Airbus family aircraft are unquestionably European products, but on the other hand, it should not be lost sight of the fact that they are finally the resultant of convergent local forces.

Considering the new CEAS, I think it is desirable to conceive it as a collecting of the eight member societies' specific skills, specific knowledges, specific know-hows and relations. This organisation should gradually become an effective and efficient **know-hows and best practices exchange centre**. The notion of "best practices", in my mind, is very important because the aeronautics projects are, like all high technology projects, made of a succession of practical difficulties to be overcome. The good achievements have to be known, but also – and especially I would say – the errors, the failures. **Lessons learned** : this is what the CEAS should allow to exchange between its member societies. Talk practical, talk realities, this is from my viewpoint quite essential.

Besides, we should take into consideration science, technology and manufacturing aspects, but also others, such as in particular education and training, human resources management, societal aspects. It would be highly useful to compare the engineers education and training in the different countries and to assess the differences with a view to identifying the advantages and disadvantages of the respective systems : Germany, France, UK, etc. We should conduct reflections in each national member society on the question : are all European needs correctly covered in our higher schools and universities ? Are module exchanges, teacher exchanges... sufficient ? A nice motto could be :

**Chance equality for all European citizens**

In short, I see the CEAS as a forum of best practices exchange : we should start our development process with this goal as a first target in our line of sight.

### CEAS bulletin

How do you envisage the working links between the CEAS and the National Aerospace Societies in order to avoid any conflicting situations or at least to minimise the possible conflicts ?

### Alain Garcia

The CEAS is a system of national member societies, so I see these relationships as a kind of intra-system links. When a Member Society works at a purely national level, there is no interference with the CEAS. This is the case for national conferences, national workshops, ... *A contrario*, within the framework of a CEAS Technical Committee, all experts concerned must conduct their work in a perfect European spirit, considering only Europe's interests. In fact, it is absolutely essential to minimise conflict probability, to : (i) make a point of constituting the different CEAS working groups in coherence with those of the national member societies ; (ii) manage the event programming with the intention to avoid any duplication between CEAS and member society ones, while on the contrary always favouring co-operations, complementarities and mutual enrichings. In this respect, the role of the Programme Coordination Committee (PCC) will be fundamental.

Besides, there are subjects for which the synergy spirit is evident. Let us come back to what I said in answer to your first question, "best practices exchange" : here we need activities conducted in parallel to finally result in a clear synthesis. Among the subjects I have in mind, is system development. How to optimise the system development process from the high level specification until the green light for manufacturing ? How to derive the specifications at equipment level ? How to validate, in laboratory or in-flight ? How to reduce the number of iterative loops ? How to assess the maturity of the system, and as soon as possible ? etc. It would be particularly useful to conduct interviews in one or two big system

companies(s) in each CEAS nation and then, to put together at CEAS level the conclusions in the form of a lessons learned compilation, highlighting the obstacles encountered, the errors made, etc. A clear objective : to build-up aids for the future, to generate know-hows for the future. An excellent subject for a symposium, is not it ?

### CEAS bulletin

Don't you think it would be highly desirable to establish, as soon as the very beginning, clear cooperation and coordination rules with the European organisations concerned – EC, ACARE, EASA, Eurocontrol, ASD, ESA, EUROCAE, AEA, EREA,... with a double objective : (i) to avoid possible duplications (in particular for the organisation of conferences, symposia...); (ii) to be as efficient and useful as possible ?

### Alain Garcia

Your question is meaningful, of course. But I would not say "as soon as the very beginning". Why ? Because first of all, we have to show and demonstrate our effective existence, to make known our works, to establish our reputation by some successful achievements, in short to solidify a hard nucleus. When we have acquired our specificity, our personality, then yes, it will be necessary – and easy – to develop those co-operations. Before that, we should clearly identify our customers, and the objectives we want to associate to each of them : industry, academics, policy makers, ...

### CEAS bulletin

We congratulate you for your nomination as head of the Aeronautics Branch. What are the main lines and principles you have in mind to constitute and then to structure your Group ?

### Alain Garcia

I am constituting a working group with a limited number of experts in order to define the goals and the organisation of the Aeronautics Branch. I shall be able to present a complete project in the first half of 2007, not before. What I can tell you immediately, is that I do not intend to deal only with technical topics. I plan to take also into consideration public policy, sociocultural aspects... Among the subjects I have in mind : how to encourage high-talented students and engineers to choose an aeronautical career ? There is today a certain disinterest of the scientific "elite" for the aerospace sector in some countries in Europe : how to reverse this trend ? Also a good subject for a European Conference, perhaps.

### CEAS bulletin

When do you think it will be possible to establish the Aeronautics Branch event Calendar covering the years 2007, 2008 and 2009 ? – Workshops ? – Symposia ? – CEAS alone ? Or CEAS in cooperation with other organisations ?

### Alain Garcia

My answer is the same as for the previous question. Not before the end of June. We have to work closely with the Programme Coordination Committee. But anyway, it is clear that the first event we have to quite successfully perform is the 1st CEAS Congress, Berlin, 10-13 September 2007. Let us succeed in it, then the horizon will be made clear !

### CEAS bulletin

Concerning the technical publications, is your concept similar to **Dr Stavrinidis** one for space ? What are the topics you intend to deal with ?

### Alain Garcia

We have still to deepen our thinking on that subject. Our philosophy will be defined by a dedicated working group in mid-2007. However, it is already my intention to include in each issue of the Aeronautics Technical Journal a Reader Digest of the most significant knowledge publications which exist in the different disciplines : structures, materials, flight control and guidance,... This will represent a fantastic added value. It will be naturally indispensable to find competent contributors to this reading and synthesis work : I think we can.

### CEAS bulletin

The AIAA publishes a high standing magazine : "Aerospace America". Would you be in favour of setting up a small working group put in charge to conduct a preliminary study concerning the creation of a similar magazine for the CEAS ?

### Alain Garcia

Yes, but I am conscious that it is a very ambitious objective, difficult to be reached. We should proceed step by step, carefully, pragmatically. First, a good quarterly CEAS bulletin in 2007, then we could set up a working group to think about possible future developments.

### CEAS bulletin

What are your 3 main wishes for 2007, regarding the CEAS development ?

### Alain Garcia

1. The effective entry into application of the CEAS administration rules.
2. The full success of the 1st CEAS Congress in Berlin.
3. The constitution of all necessary specialized committees.

## AN HISTORIC EVENT : THE A380 CERTIFICATION

On 12 December 2006 Airbus celebrated a special day in the history of civil aviation by receiving the EASA and FAA type certification for the A380, the world's largest civil airliner. The event was a premiere in several areas :

- it was the first time such an aircraft, the first true passenger double deck airliner, was successfully developed and declared technically ready to enter service ;
- it was the first time an all-new Airbus type was jointly certified by the European and American Authorities – and that in itself was a great achievement ;
- it was the first time the recently created European Aviation Safety Agency (EASA) granted such a type certificate ;
- and – last but not least – it was Airbus' first type certificate in the 21<sup>st</sup> century.

Some 600 people from both airworthiness authorities, from suppliers, Airbus engineers and top management attended this historic event.

The design of the A380 is a classic case of 21<sup>st</sup> century engineering. It will make history in this century, as the venerable 747 did in the last century. The A380 is not only the most spacious civil aircraft ever built, it is also the most advanced, representing a unique platform from which all future Airbus aircraft programmes will evolve. Flight tests have proven that the aircraft is standing on its promises, by meeting – or even exceeding - the expectations in terms of performance, range, environmental friendliness and cabin comfort.



Airbus has a long and successful record of pioneering new technology in an evolutionary and responsible manner, to ensure better aircraft performance, lower operating costs, easier handling and greater comfort. This is the corner-stone of Airbus' success in the marketplace, enabling Airbus aircraft to retain a strong competitive edge over other products. The application of advanced technology translates into immediate benefits for customers, operators, pilots, crews and passengers alike.

The A380 is a success for aviation industry and a great success for Europe, and it will become the flagship in many airline fleets all over the world. With a demand estimated at 1,665 passenger and freighter aircraft in this category over the next 20 years, it is an indispensable member of the Airbus portfolio. Together with the A350 XWB, which was formally launched on 1 December 2006, they will be the workhorses in the twin-aisle segment for the decades to come. They are the future, a future that Airbus' highly skilled and talented engineers have in their hands, because technology is at the root of it.



*From left to right : John HICKEY, FAA, Director of aircraft certification services – Marion BLAKEY, FAA Administrator – Nick SABATINI, FAA, Associate Administrator for Aviation Safety – Alain GARCIA, Executive Vice-Pdt Engineering, AIRBUS.*

Technology will be the key driver for the future, especially in a world that will be more and more submitted to environmental constraints. Technology will be more and more needed to allow Airbus to meet societies' expectations and to be given the permission to grow. The aeronautics industry will only then be able to remain an economical and development driver. Noise, emissions, rising fuel prices before this source of energy becomes scarce and is eventually replaced by some-

	
<b>European Aviation Safety Agency</b>	
<b>TYPE-CERTIFICATE</b>	
EASA.A.110	
This Certificate, established in accordance with Regulations (EC) No 1592/2002 and (EC) No 1702/2003 and issued to	
<b>AIRBUS</b>	
1 Rond-point Maurice Bellonte F-31707 Blagnac Cedex FRANCE	
certifies that the aircraft type design listed below complies with the applicable Type Certification Basis and Environmental Protection Requirements when operated within the conditions and limitations specified on the associated Type Certificate Data Sheet No A.110	
<b>Model</b>	<b>Date of issue</b>
A380-841/-842	December 12, 2006
This Certificate and its associated Type-Certificate Data Sheet, which is a part thereof, shall remain valid unless otherwise surrendered or revoked.	
For the European Aviation Safety Agency,	
 Patrick GUALDOUI Executive Director	

## AN HISTORIC EVENT : THE A380 CERTIFICATION

thing else, all these factors will be tremendous challenges to overcome. These challenges can only be met by an innovative and strong aviation industry, and an industry, which works through international co-operation. It will require the whole creativity of engineers at Airbus, but also the research institutes, and the universities, to continue being even more creative than in the past to make the unconceivable a reality. We need to continue to increase our investment in R&T at all levels for this industry to secure its future.

In the past two years Airbus has doubled its annual R&T investment to more than € 300 million. The EU and national governments have yet to match this effort if we want to secure the future of the air transportation industry, which is vital in today's and tomorrow's economy.

The joint European and American certification, the first time ever that an all new airliner is granted both type certificates simultaneously, demonstrates that, despite the very strong competition that prevails on the commercial side, engineers, administrations and all the parties involved who have one single and the same objective, namely that of ensuring safe air transportation, can productively work together in a level playing field and in a well coordinated approach. Evolution took place over the past decades at the industrial level, with the industries of the major countries integrating more and more, and this has now been complemented by the administrations of the various European countries. Now, in the early days of the 21<sup>st</sup> century, Europe has at long last one single European Aviation and Safety Agency, which has fully played its role in the certification process of the A380. The European type certificate is valid in 31 countries, the 27 Member States of the European Union as well as in Iceland, Norway, Switzerland and Liechtenstein.

Aviation brings people and economies closer together, promotes trade and cultural exchanges, and last but not least, provides millions of jobs worldwide. The aviation industry is becoming more and more global. The current Airbus products are developed and produced in many countries around the world, and this will apply even more to the A350 and to any future aircraft beyond from any manufacturer. The airplanes will all be flown all around the world. And the technologies that will be needed in the future will also be global.

The safety of aircraft are the result of both, a good design and, to a significant amount, the result of an intelligent oversight from the airworthiness authorities. However, airworthiness and flight safety standards can only be of the same stringent level all around the globe. It would therefore be extremely helpful to all parties, including the operators, if the

airworthiness authorities would be able to further develop and reinforce their capability of developing methods that allow mutual acceptance of the other's rules and regulations. Airbus strongly believes that this can only be to the benefit of an even further enhanced air transportation safety, which is the prime concern of all stakeholders.



From left to right : Rachel DAESCHLER, EASA, Project Certification Manager – Patrick GOUDOU, EASA, Managing Director – Alain GARCIA, Executive VP Engineering, AIRBUS.





## GENERAL INFORMATION

In the Quarterly Newsletter 1-2006 of the CEAS the chairman of the CEAS Space Branch, Dr. Constantinos Stavrinidis ([constantinos.stavrinidis@esa.int](mailto:constantinos.stavrinidis@esa.int)), was interviewed with respect to the future of the Space Branch, detailing his plans. These concerned, in particular, the following topics :

1. a regular quarterly "Space Bulletin" ;
2. a quarterly CEAS Space Technical Journal with referred papers ;
3. a European Directory ;
4. other benefits, e.g. organisation and support of conferences, position papers, etc.

- The first item is being addressed by extending the regular CEAS Bulletin to provide some general news from the Aeronautics Branch and the Space Branch, about four pages for each branch. This edition is the first example of such approach, and will benefit the CEAS members in receiving aeronautics and space news.

- There is progress on the second item, and an impressive number of papers are lined up for publication. However, appropriate steps are being taken to ensure that an efficient approach will be adopted which will guarantee the highest technical quality at affordable cost. There is advancement in the following committees :

- Aerothermodynamics ([Wilhelm.Kordulla@esa.int](mailto:Wilhelm.Kordulla@esa.int))
- Propulsion ([Giorgio.Saccoccia@esa.int](mailto:Giorgio.Saccoccia@esa.int))
- Structures ([Torben.Henriksen@esa.int](mailto:Torben.Henriksen@esa.int))
- Thermal ([Wolfgang.Supper@esa.int](mailto:Wolfgang.Supper@esa.int))
- Mechanisms ([Patrice.Kerhousse@esa.int](mailto:Patrice.Kerhousse@esa.int))
- ECLS (Environment Control and Life Support) ([Christophe.Lasseur@esa.int](mailto:Christophe.Lasseur@esa.int)).

The establishment of the GNC (Guidance and Navigation Control), Power, and Mission design and space systems committees is in progress.

The lists of committee members have been communicated to the member societies of CEAS in order to be complemented by additional prominent active scientists and engineers. Parties interested in any of the committees are invited to contact their national professional CEAS member society or W. Kordulla ([Wilhelm.Kordulla@esa.int](mailto:Wilhelm.Kordulla@esa.int)).

It is recalled that the role of the committees is essentially to promote the activities in typically the following manner : *Striving for excellence, and enhanced communication between scientists and engineers in the field of the discipline*

*under consideration. A particular Technical Committee (TC) of the Space Branch has the mandate to promote the research, development, validation and application of the specific field of interest in the design and verification of space vehicle systems and subsystems.*

*To achieve this goal the particular TC will organize thematic working groups, workshops and support the organisation of symposia and conferences. This includes the promotion of publications in archived scientific and engineering journals and the preparation of position papers for academia and political organisations. Care is taken that a healthy mixture of industry, research organisation, academia and space agencies is represented in the TCs. Furthermore, special interest is in the motivation of young people to further engage in Space.*

- The third item will be actively undertaken now that operations of the newly formed Council of European Aerospace Societies have been initiated.

- The fourth item is being elaborated. A good example is collocating and joining the Space Structures Conference which takes place every three years, with the CEAS Conference on "Century Perspectives", Berlin, 10-13 Sept. 2007.

## BRIEF NEWS ABOUT Selected European and national Space Projects

- **ESA: SMART-1 Electric Propulsion: A Success Story** (D. Estublier, ESA/ESTEC, TEC-MPC)

The SMART-1 mission was the first of the European Space Agency's (ESA) Small Missions for Advanced Research in Technology. The objective was to test new enabling technologies for forthcoming ESA Cornerstone science missions like Bepi-Colombo towards the planet Mercury. SMART-1 was launched on September 27<sup>th</sup> 2003, as an auxiliary passenger on Ariane 5. SMART-1 recently completed its successful 3-year mission after a well controlled crash-landing on the surface of the Moon on September 3<sup>rd</sup> 2006.

The critical technology that has been demonstrated on SMART-1 was primary solar electric propulsion with the PPS-1350-G Hall-Effect plasma thruster, developed and qualified by Snecma (F). This flight demonstration has allowed cumulating an impressive number of "firsts" and breaking a number of records at European and worldwide level. From a mission point of view, it was the first time that:

- electric propulsion was used to escape Earth from a geostationary transfer orbit, performed gravity-assist manoeuvres, and was captured by a celestial body using weak-stability boundaries ;

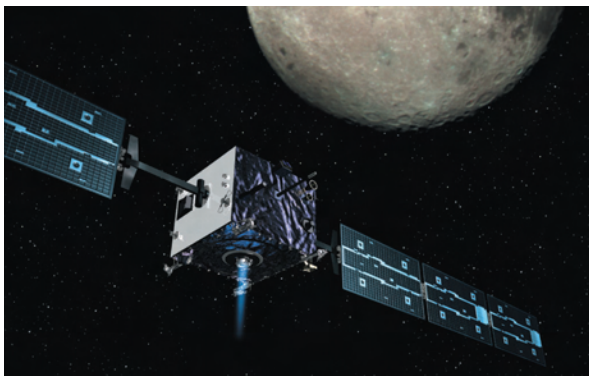
- ESA was sending an orbiter around the Moon ;
- a Moon orbiter had a propellant fraction as low as 22% with only 82 kg of xenon propellant.

Finally, from a technology performance point of view, it was the first time that a Hall-effect plasma thruster:

- was used for primary propulsion under variable power conditions ;
- was operated continuously for more than 240 hours and cumulated 5000 hours of operations in space.

A demonstration mission with electric propulsion (EP) was a necessary key milestone towards a full acceptance of this once emerging technology that had now reached full maturity and could benefit from the latest advances from space power generation. The SMART-1 mission has not only demonstrated that the propulsion system performed as expected but also that the system reliability (designed mostly as single string) was very good, despite the challenging environmental conditions experienced throughout the mission (extensive crossing of radiation belts, solar flares, Moon albedo).

In addition, the understanding of in-flight operational aspects was fundamental for electric propulsion since they were often seen as inconvenient due to the long duration thrust period needed to compensate for the low thrust capability. Compared to chemical propulsion with mainly very few short thrust pulses, electric propulsion must be paired with a relatively high level of onboard autonomy and accurate pointing of thrust vector and solar arrays during long periods of time. This was certainly a new way of managing missions from the ground and SMART-1 has paved the way for that while collecting some important lessons learned with respect to the sensitivity to the proton environment, the necessity of interrupting the thrust during eclipses, and the open-loop onboard power regulation.



From a mission point of view, the long low-thrust manoeuvres have very large advantages because changes occur slowly and wrong manoeuvres can be easily corrected with negligible propellant mass penalty. Failed operations can be more easily recovered than with impulsive manoeuvre since there

is much more time to have a second chance or to determine a fallback solution. Finally, electric propulsion is very often a mission enabler for propellant-demanding scientific mission, and long-duration commercial missions.

With the completion of such a flight demonstration, SMART-1 has made a very valuable contribution to the future extensive use of electric propulsion in general, by successfully validating all the critical aspects of its use, covering in particular the technology qualification of the Hall-effect plasma thruster, but also the flight dynamics, and the operations.

• **DLR : SHEFEX (SHarp Edge Flight EXperiment) the past and planned in-flight experimentation The Hypersonic Flight-Experiment Programme of DLR (J. Longo, DLR AS)**

On Thursday 27 of October 2005 the first experiment of the DLR hypersonic SHarp Edge Flight EXperiment Program was successfully launched at the Andøya Rocket Range in northern Norway with the purpose to investigate possible new shapes for future launcher or re-entry vehicles applying a shape with faceted surfaces and sharp edges. Through the initiation of the SHEFEX Programme, DLR is examining the possibilities of sounding rockets to provide a platform for flight experiments in hypersonic conditions as cost-efficient supplement of tests in ground based facilities. Sounding rockets may be the way of access to a certain type of “sky based facility”, in analogy to the ground based facilities, concurrent in price also with today’s so-called “industrial wind tunnels”, but in any case, extremely less expensive and less risky than the so-called “X-vehicles”. Performed under responsibility of the German Aerospace Center (DLR) and financed in the frame of the space program of the Helmholtz Association of German Research Centres and DLR, the SHEFEX Program is the result to link the efforts of several DLR research institutes: the Institute of Aerodynamics and Flow Technology with sites in Braunschweig, Göttingen and Cologne; the Institute of Structures and Design in Stuttgart; the Mobile Rocket Base of DLR (MORABA) in Oberpfaffenhofen and the Institute of Research on Materials situated in Cologne.

SHEFEX-1 has been the pathfinder experiment of the program. It is not a new re-entry vehicle but a hypersonic experiment to test new concepts for future aerospace vehicles which should have the potential to reduce cost and servicing efforts for the TPS and at the same time enhance vehicle performance due to the hypersonic exploitation of the aerodynamic sharp configuration concept. Driven by the faceted concept, two main criteria have been used to define the shape of the SHEFEX-1 experiment. To have as much as possible faceted panels (totally 31) and to represent as many as possible configuration details of space vehicles, like concave and convex chamfers and a sharp un-swept leading edge. The experiment flew on top of a two-stage solid propellant sounding rocket

consisting of a Brazilian VS30 motor as first stage and an improved Orion motor as second stage. Designed as a passive flight experiment SHEFEX-1 does not have control devices. After burn-out the second stage remained attached to the body till almost the end of the experiment to provide flight stability through its fins. The experimental phase took place in the atmospheric down-leg of the trajectory while the aerodynamic layout was dominated by the large amount of lift production of the asymmetric fore body. While due to a sensor failure the recovery system could not produce a soft landing and flotation in the water inhibiting to recover the payload as expected, the analysis of the telemetry and radar data shows that all major aims of the test campaign have been achieved. The post flight analysis of the first experiment of the program is progressing in parallel to the preparation of the second one. The SHEFEX-2 experiment shall focus on hypersonic guidance with moving canard fins while new thermal-protection-system concepts will also be a subject of investigation. In comparison to SHEFEX-1, the faceted experiment fore body is designed to be symmetrical. For the flight experiment the boundary conditions demand a maximum velocity in the order of  $Ma \sim 12$  on the down leg part of the trajectory. Flight control manoeuvres will take place in the higher layers of the atmosphere ( $\sim 60$  km). The experiment phase shall end at an altitude of 20 km with subsequent recovery. Since it is desired to increase experimentation time as much as possible, in the order of 30 s to 60 s, the requirements of velocity and flight time in atmosphere for the experimentation phase have led to a new approach for the whole mission scenario. An exoatmospheric re-pointing manoeuvre of the 2nd stage and payload is considered in order to reduce the trajectory apogee and also the re-entry angle, resulting in longer operation time for control manoeuvres. The variation of the conventional parabolic trajectory will increase dramatically the down range and poses also problems with real-time telemetry and telecommand. The current scenario is based on a launch from Andoya Rocket Range as for SHEFEX-1 experiment. A down range in

the order of 1500 km is not a restriction as the Norwegian Sea and polar cap is available for impact. The impact point then would be approximately 600 km off the North Pole on the pack ice where 'land' recovery is possible. Current flight schedule is spring 2010.

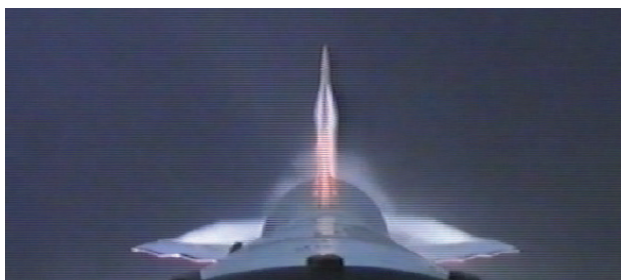
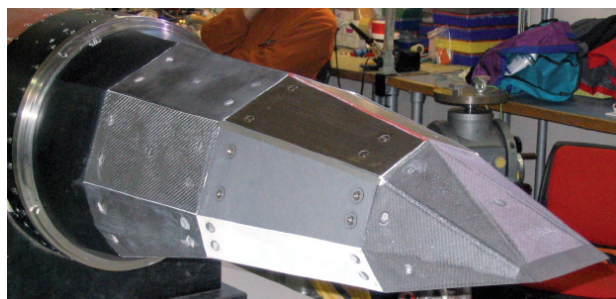
## SOME FORTHCOMING SPACE-RELATED CONFERENCES/WORKSHOPS

- 10<sup>th</sup> European Conference on Spacecraft Structures, Materials & Mechanical Testing, 10-13 Sept. 2007, Berlin, Germany, Estrel Hotel (in connection with the 1st CEAS European Air and Space Conference, see also [www.CEAS2007.org](http://www.CEAS2007.org))
- 6<sup>th</sup> International Symposium "Environmental Testing for Space Programmes", 12-14 June 2007, ESA/ESTEC, Noordwijk, The Netherlands (see also <http://conferences.esa.int/>).
- 7<sup>th</sup> International Symposium on Launcher Technologies, 2-5 April 2007 Barcelona, Spain ([www.launchers-symposium.org/](http://www.launchers-symposium.org/)).
- 5<sup>th</sup> International Planetary Probe Workshop (preceded by a two-day short course), 25-29 June, 2007, Bordeaux, France, ([www.rssd.esa.int/SM/IPPW](http://www.rssd.esa.int/SM/IPPW))
- International Carbon Conference in Aerospace Valley – Solutions for high demanding applications, 17-19 Sept. 2007, Arcachon, France ([www.avantage-aquitaine.com](http://www.avantage-aquitaine.com))

### Figures description :

*SHEFEX-1 launch, October 27, 2005 (left).*

*SHEFEX-1 payload (right up). High temperatures on the leading edges of the fins of the 2<sup>nd</sup> stage during re-entry flight (right down).*



## 6<sup>TH</sup> INTERNATIONAL SYMPOSIUM on Environmental Testing for Space Programmes

EUROPEAN SPACE RESEARCH  
AND TECHNOLOGY CENTRE  
(ESA/ESTEC)

Noordwijk, The Netherlands  
12 – 14 June 2007



### OBJECTIVES

The 6<sup>th</sup> International Symposium on Environmental Testing for Space Programmes is designed to continue to provide an International forum for discussing and exchanging ideas and experiences of test facilities & methods, developments, and organisational aspects for small and large projects. The success of these symposia since 1990 has demonstrated the great interest of companies, organisations and institutes involved in the verification of space hardware and software.

### ORGANISATION

The Symposium will extend over three days. It will start with a plenary session, followed by a stream of sessions on various topics of interest, and eventually a conclusion and discussion plenary session, all with oral presentations. A dedicated area will also be provided for poster presentations.

### TOPICS OF INTEREST

Prospective contributors are encouraged to present papers on the following topics, in English.

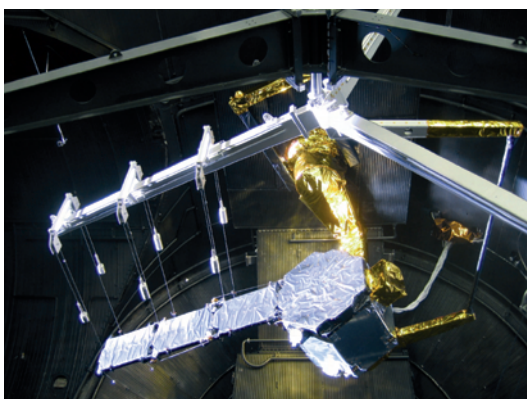
- Environmental Test Methods;
- Materials in Space;
- Environmental Test Facilities.

### ABSTRACT SUBMISSION

Contributed papers are selected based on submitted one-page abstracts written in plain text (ASCII) and not exceeding one page in A4 format. Abstracts will be accepted for evaluation until 15-February 2007.

Abstracts should be submitted by completing the abstract submission form. This may be found by going to the following site and following the links to the conference and then to the corresponding form.

<http://conferences.esa.int>, or via [esa.conference.bureau@esa.int](mailto:esa.conference.bureau@esa.int)



The abstract must specify Symposium name, Title of paper, Topic area (from the above list), Name and affiliation of author(s), Full contact details for the contact author including mail, e-mail, phone and fax and the Preference for oral or poster presentation  
Acceptance of papers will be notified by 2 March 2007.

The registration fee is € 500 ( € 450 before 16 April, and € 200 for students) and includes access to the presentations, the conference bag, the abstract book, the Symposium Proceedings, a cocktail party, the Symposium dinner, refreshments, and transportation to and from the hotels booked by the ESTEC hotel reservation service.