

# TRENDS AND FUTURE OF ON-BOARD ENERGY IN SPACE SYSTEMS

*Preparing the Next Fifty Years*



Authors should submit by July 18<sup>th</sup>, 2008 :

- An abstract describing the topic and interest of the presentation (300-500 words), saved as a Word document (.doc)
- Title of the conference, Prime author, Co-authors and companies, coordinates (complete mailing address, phone and fax numbers, e-mail address) of the Prime author.

These documents should be sent to

3AF - 6, rue Galilée - 75016 Paris - France  
Tél. : 33 (0) 1 56 64 12 30 - Fax : 33 (0) 1 56 64 12 31  
E-mail : [secr.exec@aaaf.asso.fr](mailto:secr.exec@aaaf.asso.fr)

## Notification of acceptance or refusal

The Programme Committee will notify all authors of its decision in September (week 37). This notification will be accompanied by detailed instructions allowing selected authors to prepare and send to the secretariat their full presentation for October 20<sup>th</sup>, 2008.

**Language** Papers will be written and presented in English

**Secretariat** 3AF - 6, rue Galilée - 75016 Paris - France  
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## Centre International de Congrès

6, rue Pente rapide - Charles Ansidei - B.P. 149 - 84008 Avignon Cedex 1  
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## How to reach Avignon ?

- **3 airports**
  - Avignon (10 min)
  - flights from : Paris - Cherbourg - St Étienne - Bordeaux - Toulouse - Strasbourg - Nantes - Rennes
  - Nîmes (30 min drive to Avignon)
  - Marseille-Provence (45 min drive to Avignon)
  - 67 direct flights from Amsterdam - Athènes - Barcelone - Lisbonne - Londres - Munich - Zurich...
- **TGV (High speed railway)**

Paris	2h40
Roissy Charles de Gaulle	2h44
Lille Europe	3h50
Nantes	5h27
Rouen	4h52
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- **2 highways**
  - A9 «languedocienne» and A7 «autoroute du soleil»

2<sup>nd</sup>  
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# TRENDS AND FUTURE OF ON-BOARD ENERGY IN SPACE SYSTEMS

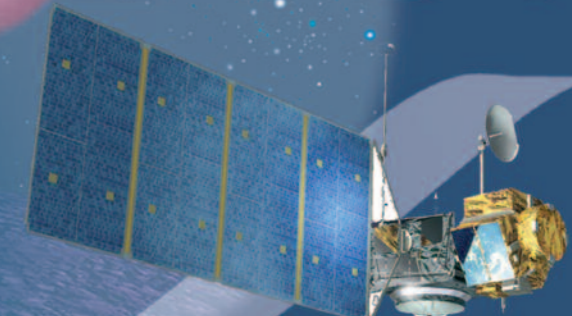
*Preparing the Next Fifty Years*

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# TRENDS AND FUTURE OF ON-BOARD ENERGY IN SPACE SYSTEMS



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#### CHAIRMAN OF THE PROGRAMME COMMITTEE:

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## Background

The 3AF Energetic Technical Committee is pleased to announce its fourth Congress to be held in the "Popes' Palace" ("Palais des Papes") in Avignon, France, November 24-26, 2008.

After the third Congress dedicated to "Challenges for On-Board Energy" in June 2006, this new event will focus on

### « TRENDS AND FUTURE OF ON-BOARD ENERGY IN SPACE SYSTEMS: Preparing the next 50 Years »

This congress aims at being a milestone in terms of technical exchanges in field of the space exploration; since 2007 is the 50th anniversary of the launch of Sputnik, we will take advantage of this opportunity to have an overview of the preparation of the next 50 years of On-Board Energy.

During those last fifty years new technologies have been developed and now have a very promising future; for example new projects are using Li-Ion batteries, fuel-cells, advanced pyrotechnic gas generators, electric actuators, safer and more reliable devices, hybridization, etc.

The new challenges for these next fifty years ask actors to cope with several problems as the development of new kinds of energies, the improvement of the compactness of on-board devices, the design of new sources of energy to get a high availability for space exploration (e.g. Earth return missions), the storage of energy and, of course, the management of different sources of energy at the platform level. More generally speaking, all these changes are required for all kinds of future platforms; exchanges between actors from different horizons are important to pave the way for implementation of these changes.

## Preparing the Next Fifty Years

## Scope and framework of the Congress

Among all the subjects which could raise from these problems the selected presentations will preferably treat the following topics :

- New kinds of energy which are considered today in order to get higher performances such as very long mission duration, very long shelf life, ... and other performances required for new types of missions
- Energy Management and Hybridization
- Improved Safety and Reliability
- Improved Compactness of Sources of Energy
- Space exploration projects which might make energy-related technologies questionable
- "Green" gas generators and other energetic devices for space exploration
- Generally speaking, Space Vehicles and Programs (civilian and military).

In addition to these key topics, presentations which emphasize on On-Board energy in the future will be considered since the aim is to outline the on-coming On-Board technologies.

## Objective

The purpose of this meeting is to share the objectives and promote the new technologies associated with energy required by space platforms (spacecraft, launch vehicles...) for the future, but also to be a forum of valuable exchanges between participants. The Agencies and Prime Contractors will explain their top-down point of view for these new challenges. Industry, Equipment Manufacturers, Subsystems Primes, Research Bodies and Universities will provide bottom-up perspectives. Both civilian and military applications will be considered.

## Themes

The various forms of On-Board Energy will be examined ; topics as mechanical, fluid, chemical or electric ones, will be covered through the following technologies (non restrictive) :

- energetic materials, pyrotechnics, shape memory alloys, energy nanotechnologies, cryotechnics, propulsion technologies, green propellants,
- photovoltaic technology, sources of electrochemical energy,
- servo-actuators, mission controls, life-saving systems,
- means of storage, generation, restitution and conversion, regulation and "management", conditioning (air, temperature, etc.), filtration,
- fluid technology, ...

Space Agencies and Prime Contractors will present their future missions and, in order to make these missions possible and successful, propose the long terms requirements and challenges assigned to On-Board Energy; the scope should be as wide as possible, including interplanetary exploration.

In parallel of those general objectives, forecast in technological advances for the 50 next years will be dealt with: Equipment Manufacturers will present mid-term R&D projects and expected increasing of performances, while Research Bodies, Universities and Laboratories will present emerging technologies among the most promising to pave the way for future systems in the next decades.

Those presentations of future systems, equipment and technologies will include:

- new materials and technologies to improve the yield of energy
- new sources of energy, mini-sources
- hybridization of energy sources, "more electric vehicles"
- optimization of on-board architectures
- development of tools to simulate and to design complex systems
- integration and implementation of systems
- "system" validation
- "green design" and dismantling at life termination
- ....