

# SPACE PROPULSION 2016



CALL  
FOR  
PAPERS

Following four editions of success, 3AF, ESA, CNES, DLR and ASI are pleased to announce:

## SPACE PROPULSION 2016

The fifth of a new series of international conferences on technical and programmatic aspects related to the development and application of Space Propulsion technologies.

MARRIOTT PARK HOTEL, ROME, ITALY • 2<sup>ND</sup> TO 6<sup>TH</sup> MAY 2016

Space Propulsion 2014, organized by the Association Aéronautique et Astronautique de France in close collaboration with ESA and CNES has proven to be a great and growing success.

This achievement was possible thanks to the participation of a large number of top-ranking delegates from the international space sectors (Head of Agencies, Space Operators, Industry CEOs), to European and International Agencies and Industry support (NASA, DLR, ASI, EADS ASTRIUM, SAFRAN, MOOG, AMPAC ISP, ALTA Space, ECAPS and Nanospace) and to a great number of high quality papers presented throughout the event.

The Space Propulsion Conference is now recognized to be the “forum” supporting the preparation of future activities and roadmaps in all the fields of space propulsion. The 5<sup>th</sup> edition of this International Conference is planned from 2<sup>nd</sup> to 6<sup>th</sup> May 2016 in Rome (Italy) and the programme of the event is being organized in such a way as to highlight programmatic and technical issues and to promote exchange of views and information in the two main areas of propulsion for spacecraft and for space transportation.

The 5<sup>th</sup> edition will be organized around 5 axes:

- An opening day dedicated to plenary sessions and round tables during which agencies' general directors, industry, integrators and equipment manufacturers will be invited to speak
- 4 days dedicated to parallel presentations and plenary sessions on different themes
- A space reserved to exhibitors
- Ad-hoc workshops
- Technical courses on Sunday 1<sup>st</sup> May 2016 (the organisation of these courses needs to be confirmed. Please refer to the website for more information)

We look forward to welcoming you in Rome for Space Propulsion 2016!

G. SACCOCCIA (ESA) and D. RIBEREAU (3AF and SAFRAN HERAKLES)  
Conference Chairmen

NEW ABSTRACT SUBMISSION  
DEADLINE: 21<sup>ST</sup> OCTOBER 2015

[WWW.PROPULSION2016.COM](http://WWW.PROPULSION2016.COM)



## SPACECRAFT PROPULSION

For the area of application to spacecraft, Space Propulsion 2016 is soliciting abstracts on the following subjects (some topics include a non exhaustive list of more detailed themes as guidance for abstract submission):

- Chemical, electric, nuclear and advanced spacecraft propulsion systems
- Propulsion components
- Production, manufacturing, material and processes
- Overview of current programmes (requirements, roadmaps, solutions)
- AIV aspects and tools (facilities diagnostics, methodologies)
- Flight testing and experience (operations, lessons learned, feedback from in flight failure and anomalies, satellite passivation and deorbiting strategies)
- Technology building blocks for future spacecraft propulsion systems including exploration
- Green Propulsion for spacecraft and New Propellants (ongoing programmes and applications, R&D)
- Rocket propulsion & global environment (Clean Space, impact of new regulations)
- Cost-related aspects of spacecraft propulsion
- Modelling (all propulsion systems design and performance evaluation)
- Theoretical performance vs status of technology: how to push the limits (materials, design solutions, efficiency/specific weight, energy generation cycles, etc)

### Spacecraft Propulsion Technical Committee

M. Andrenucci	SITAEL
K. Anflo	ECAPS
N. Arcis	CNES
I. Coxhill	MOOG
A. Demairé	OHB SWEDEN AB
O. Duchemin	SAFRAN SNECMA
P. Garcon	TAS
D. Gibbon	SSTL
I. Katz	JET PROPULSION LABORATORY
I. Masuda	JAXA
A. Oren	RAFAEL
M. Peukert	OHB SYSTEM AG
J. Polk	JET PROPULSION LABORATORY
G. Popov	RIAME
N. Püttmann	DLR
G. Saccoccia	ESA
S. Schlechtriem	DLR
G. Schmidt	NASA
G. Schulte	AIRBUS DEFENCE & SPACE
I. Shigeyasu	IHI AEROSPACE
R. Spears	L-3
F. Wilson	AEROJET

## PROPULSION FOR SPACE TRANSPORTATION (LAUNCHERS)

For the area of application to space transportation systems, Space Propulsion 2016 is soliciting abstracts on the following subjects (some topics include a non exhaustive list of more detailed themes as guidance for abstract submission):

- Propulsion sub-systems and components (turbo machinery, thrust chambers, nozzles, LH2 fluid bearings, open impeller integration in turbo pumps, etc)
- Production and manufacturing issues (large boosters, components, etc)
- Liquid, Solid, Hybrid and Air-breathing Propulsion Systems for Launcher and Upper Stages (full expander cycle vs expander bleed cycle: advantages and limits, rocket engine reliability estimation, composite casing experience and future evolutions, idle mode or high throttling mode of rocket engines)
- Overview of current programmes (requirements, roadmaps, solutions)
- AIV issues and tools (facilities diagnostics, methodologies, telemetry and other advance measurement techniques)
- Flight testing and experience (operations, lessons learned and future evolutions, idle mode and anomalies, satellite passivation and deorbiting strategies)
- Technology building blocks for Future Space Transportation Propulsion Systems: Launchers, Exploration platforms and Space Tourism (cryogenic long term storage in space, fluid transfer, etc)
- Green Propulsion and New Propellants for Space Transportation (ongoing programmes and applications, R&D)
- Rocket propulsion & global environment (REACH, impact of new regulations, dismantling of unused SRMs)
- Cost-related aspects of Space Transportation propulsion
- Modeling (CFD & validation of cryogenic, liquid, solid, hybrid: application to rocket engines, fluid management in micro gravity, combustion instabilities, etc)
- Pressure-Thrust oscillations issues (in-flight measurements, multi-physics coupling modeling, etc)
- Impact of new requirements & regulations on design (debris mitigation, REACH...)

### Space Transportation Technical Committee

E. Abriat	MOOG	G. Langel	AIRBUS DEFENCE & SPACE
M. Atsumi	MHI	J. Littles	P&W ROCKETDYNE
M. Biagioni	AVIO	S. Mossolov	KELDYSH CENTRE
S. Bianchi	AIR LIQUIDE	K. Okita	JAXA
D. Boury	SAFRAN HERAKLES	U. Palmnas	VOLVO
J. Breteau	ESA	M. Pessana	TAS
P. Claudel	ARIANESPACE	F. Rossi	ESA
A. de Lillis	ASI	D. Ribereau	SAFRAN HERAKLES
P. Fortunier	CNES	G. Vigier	AIRBUS DEFENCE AND SPACE
J. Gigou	ESA	P. Yvart	SAFRAN HERAKLES
F. Jean	SAFRAN SNECMA	L. Yu (pr)	CALT
M. Habiballah	ONERA	M. Onofri	UNIVERSITY OF ROME (SAPIENZA)
S. Henry	SAFRAN HERAKLES		

## CONFERENCE SCHEDULE

Abstract submission procedure .....	April 2015
<b>Deadline for Abstracts .....</b>	<b>NEW DEADLINE FOR ABSTRACTS 21<sup>ST</sup> OCTOBER 2015</b>
Notification of Acceptance to Authors .....	End November 2015
Preliminary Programme .....	January 2016
Online registration opening .....	1 <sup>st</sup> February 2016
Deadline for Manuscripts .....	10 <sup>th</sup> April 2016
<b>SPACE PROPULSION 2016 .....</b>	<b>2<sup>nd</sup> - 6<sup>th</sup> May 2016</b>

Due to the Conference growing success, Space Propulsion 2016 has been organized on 5 days instead of 4 in the past editions !

## ORGANISING COMMITTEE

**Giorgio Saccoccia** (ESA, The Netherlands)  
**Alexa Faucher** (3AF, France)

## CONFERENCE SECRETARIAT

AAAF : 6, rue de Galilée • 75016 Paris - France

Phone : +33 (0)1 56 64 12 35  
Fax : +33 (0)1 56 64 12 31  
E-mail : alexa.faucher@aaaf.asso.fr / sp2016@aaaf.asso.fr  
Web : www.propulsion2016.com

## CALL FOR PAPERS

### Advice to authors:

- The main purpose of the abstract is to give the Technical Committee information to assist them in selecting the papers to be presented at the conference.
- The selected papers will be presented in a 15 minute speech at the conference (+ 5 minutes for Q&A).
- An abstract will be selected based on the importance and originality of the subject addressed, on its relevance to the conference theme, on the clarity of its expression.
- The abstract should be a "stand alone" summary that can be used in the compilation of abstracts.
- The abstract should be in English and no longer than 400 words.
- The abstract should summarize the main objectives of the paper to be presented and outline its conclusions.
- Work that has been presented elsewhere, and not updated, will be considered inappropriate.
- All abstracts should be submitted on [www.propulsion2016.com](http://www.propulsion2016.com)

### Notification of Acceptance/Refusal

The Organising Committee will notify all authors of its decision in November 2015. This notification will be accompanied by detailed instructions allowing authors to prepare and send their paper to the AAAF Secretariat by 10<sup>th</sup> April 2016.  
*Please note that failure to comply with the deadline will entail not having the manuscript included in the conference proceedings.*

### Language

Please note that the official language for the symposium will be English. All presentations and documents must be in English.



## THE CONFERENCE VENUE

Space Propulsion 2016 will be held in the Marriott Park Hotel Rome

Via Colonnello Tommaso Masala 54  
00148 Roma, Italy  
+39 06 658821

## GENERAL INFORMATION

**Modern and old, past and present go side by side, all the time.**

Whether you are in Rome for 3 days, 3 weeks or 3 months, be prepared to step into the world's biggest open air museum. You can decide to follow the typical tourist paths or you can be lucky or brave enough to go off the usual tracks. One way or the other, Rome will seduce you and it will hardly leave you indifferent. It will surprise you, like a beautiful middle

aged woman that has still plenty to offer and whose beauty is just been merely blurred by time passing by.

Rome is one of world's most photogenic cities - not surprising when you remember what's here - The Vatican, the Trevi Fountain, St Peter's Square, Spanish Steps, Colosseum...

Whether you spend your time sightseeing, or lazing in cafés watching the world go by, it will be your turn to feature in your very own Roman Holiday.

## ACCOMMODATION

Accommodation at the conference venue is strongly recommended. Accommodation rates at the Marriott Park Hotel are as follows :

Double room for single use	120,00 € + VAT including American Buffet Breakfast
Double room	140,00 € + VAT including American Buffet Breakfast
Junior Suite	190,00 € + VAT including American Buffet Breakfast
Suite	280,00 € + VAT including American Buffet Breakfast

Please note that a local tax of 3,00 € per day/person will be applied

To book your accommodation at the Marriott Park Hotel please go to [www.propulsion2016.com](http://www.propulsion2016.com)

For alternative accommodation and a list of hotels and hostels in Rome, please visit the city's website: [www.rome.info/accommodation](http://www.rome.info/accommodation)

## ACCESS



### Rome by airplane

Rome has two airports - Fiumicino (Leonardo da Vinci) and Ciampino.

#### Fiumicino

This is Rome's main airport and is well-connected with the centre during the day by an express train.

The express train between Fiumicino Airport and Stazione Termini (Rome's main train station) costs € 9.50 and the journey takes about 30 minutes. The train departs from and arrives at Termini station at track n.27 and runs from 6.30am till 11.30pm.

#### Ciampino

Rome's smaller airport, is mostly used by charter flights and budget airlines.

To get to the centre from this airport, take COTRAL bus, get off at Metro A: Anagnina station, then to Termini Station. COTRAL bus runs every 30 minutes, until 11pm. The only way how to get to Rome after this time is to take taxi.

## GETTING AROUND ROME

You can buy Roma Pass online and benefit from various discounts and services that make it easier and cheaper to enjoy Rome.

The historic centre is not particularly large (only 2,5 km/1,5 miles from the Colosseum to Piazza di Spagna) and so is easy to visit on foot, as most monuments are to be found in the same area.

### Public transportation

Rome's bus network is extensive and functions quite well, but the metro (subway) is much simpler for the short-term visitors to master. Public transportation tickets must be purchased in advance from tabacchis, newsstands, bars, or vending machines (exact change only!) at metro and major bus stops.



### Metro

The Roman metro (called Metropolitana by residents) goes round rather than through the historic city. It has only two lines, A (red) and B (blue), which cross at Termini Central Station.

Trains run approximately every 7-10 minutes, from 5:30am until 11.30pm every day (until 0:30am on Saturdays).



### Buses and Trams

There are hundreds of bus lines, running from 5:30am till midnight. All buses and trams travel in both directions.

#### Electric buses

In an effort to minimize pollution in the small backstreets of the historic center, the city has established several electric bus lines to navigate alleyways barely wide enough for a Vespa.

#### Night buses

Over 20 night bus lines run from 00:30am to 5:30am. The main terminal stations are Termini (Piazza dei Cinquecento) and Piazza Venezia. From these two piazzas buses leave for all directions every 30 minutes. Night bus stops are marked with an owl. You can purchase tickets on board.

For lines tables and public transport maps visit official site of public transportation in Rome - ATAC S.p.A



### Taxi

If you need a taxi, remember to look for the official metered white or yellow taxis. There are taxi ranks in many locations throughout the center, but is nearly impossible to hail one driving down the streets, particularly at night. Make sure your taxi is metered; insist on the metered fare, rather than an arranged price.

To call for a taxi within Rome, try 06 3570, 06 4994, 06 6645, 06 551, or 06 8822.



### Renting bikes or scooters

Although most of the sights in Rome are within walking distance or accessible by public transportation, two wheels will give you the freedom to see exactly what interests you, and in less time.

To really "do as the Romans do", you have to drive around on a Vespa. You'll have no trouble finding rental places all around the city. Rental average are €40-€50 for a one day.



### Climate

May is a fantastic time to be in Rome, when the weather is warm and dry. At this time of the year, the average temperature begins at 15°C and gradually increases to 20°C as the month progresses. There are around 12 hours of sunshine each day – significantly more than the previous months – and the average sea temperature toward the coast is pleasantly mild at 19°C. With only 48 mm of rainfall spread across ten days, you might be lucky enough to get away with only a shower or two during your stay.