

1st IAA Conference on Dynamics and Control of Space Systems - DyCoSS'2012

Final Report

The first IAA Conference on Dynamics and Control of Space Systems - DyCoSS'2012 was held in Porto, Portugal in the Hotel HF Ipanema Porto on March 19-21, 2012 with the aim to join specialists in Astrodynamics, Space Flight Mechanics, and Space Structures. The Conference was organized by the International Academy of Astronautics (IAA) with the cooperation of the American Astronautical Society (AAS). The conference Chairs are Anna D. Guerman (Portugal), Peter M. Bainum (USA), and Jean-Michel Contant (France). Its International Program Committee consisted of

- Kyle Terry Alfriend, USA
- Hyochoong Bang, Korea
- Franco Bernelli, Italy
- James Biggs, UK
- Jeng-Shing Chern "Rock", Taiwan
- Bernd Dachwald, Germany
- Harijono Djojodihardjo, Malaysia
- Antonio Elipe, Spain
- Margarida Ferreira, Portugal
- David Folta, USA
- Ijar Fonseca, Brazil
- Gerard Gomes, Spain
- Filippo Graziani, Italy
- Christopher D. Hall, USA
- Kathleen Howell, USA
- Junichiro Kawaguchi, Japan
- Ivan Kosenko, Russia
- Richard Longman, USA
- Robert Melton, USA
- Arun Misra, Canada
- Yasuhiro Morita, Japan
- Michael Ovchinnikov, Russia
- Maria Rosario Pinho, Portugal
- Antonio Bertachini Prado, Brazil
- Georgi Smirnov, Portugal
- David B. Spencer, USA
- Paolo Teofilatto, Italy
- Zhang Wei-Hua, China

The local organization was supported by the Centre for Aerospace Science and Technologies of the University of Beira Interior, Covilha (UBI), and the Engineering Faculty of the Porto University, Portugal (FEUP) with the following Local Organizing Committee:

- Anna D. Guerman, UBI, coordinator
- Margarida Ferreira, FEUP, coordinator
- Maria Rosario Pinho, FEUP
- Georgi Smirnov, University of Minho, Portugal
- Miguel Ângelo Silvestre, UBI.

The technical support was provided by Mr. Nikolai Danylchuk.

The Call for Papers invited manuscripts on topics related to analysis of space systems, including but not limited to:

- Attitude dynamics and control;
- Attitude sensors and actuators;
- Dynamics and control of large space structures and tethers;
- Mission design and optimization;
- Optimal control in space flight dynamics;
- Orbital dynamics and determination;
- Satellite constellations and formation flying;
- Space structures development and verification;
- Spacecraft guidance, navigation and control.

To attract the largest possible number of participants, we organized an intensive publicity campaign and took several measures to enhance the incentive for participants, including establishing of the registration fees at very low values (the Early Bird registration was only 300€).

The total number of submissions surpassed all expectations, achieving 183 abstracts from 23 countries from Europe, Asia, Africa and America (only Australia and Antarctica were not represented). After the review process, 155 papers were accepted for presentation.

The papers were organized in 15 thematic sessions; with 10-11 papers in each session. The final program included 138 presentations, though during the conference only 107 papers have been actually presented, others

being late withdrawals or “no show”. A relatively high number of withdrawn papers can be explained by several reasons, such as difficulties in obtaining the travel funding or some problems with getting entry visa (the latter have been timely resolved in almost all cases except for some late visa requests from China). However, and as usual, some papers could not be presented just because the authors failed to get everything ready in time for the conference.

The Opening Session began with a brief introduction of the conference by Anna Guerman and the welcome message from Prof. Peter Bainum who could not be present in person, so his message was read by Prof. Kathleen Howell. The second speech was delivered by Dr Antonio Neto da Silva, President of Proespaço - the Portuguese Association of Space Industries, who informed the audience of the Proespaço proposal for the Portuguese national strategy for the space industry. Finally, Dr. Jean-Michel Contant, the Secretary General of International Academy of Astronautics presented a talk “THE INTERNATIONAL ACADEMY OF ASTRONAUTICS AND ASTRODYNAMICS: FIFTY YEARS OF EXCELLENCE”. All contributions caused a great interest among the public.

The Opening Session was followed by the Keynote Lecture of Dr. Constantinos Stavriniadis, Head of Mechanical Engineering Department of ESA-ESTEC, titled “DYNAMICS AND CONTROL OF SPACE SYSTEMS”. The presentation was dedicated to the modern problems in space systems dynamics that arose in the development of ESA missions.

The work of thematic sessions of DyCoSS began in the afternoon of March 19 and continued to the afternoon of March 21. Most sessions functioned very well, with large number of participants (the average number rounded 30-35 per session) and intensive discussions following the presentations. However, a couple of afternoon sessions on March 21 were affected by “no-shows” and ended earlier than expected.

At the end of the final day of the Conference the International Program Committee met for the last time and discussed the conference outcome and the learned lessons, formulating a number of suggestions for the next conference Organizing Committee. In general, the opinions on DyCoSS organization were very high and the common feeling was that in two years the conference should be organized again. Some suggestions were made regarding the eventual venues of DyCoSS’2014.

The conference proceedings are now being prepared for publication by Univelt, Inc. in AAS Advances in the Astronautical Sciences Series. A selection of the best papers was recommended for publishing, after peer review, in a Special Issue of the IAA Journal Acta Astronautica. This Special Issue has been open already and now is under submission/review process.

The Conference DyCoSS’2012 was followed by a satellite event, 7th International Workshop and Advanced School “Spaceflight Dynamics and Control” organized by CAST and FEUP at the Engineering School of the Porto University on March 22-23, 2012. The Advanced School web page (www.aerospace.ubi.pt/workshop2012) contains the detailed information on the event, as well as the presentations made by the participants. The video of presentations will be available on this page soon.

Final note. The common opinion expressed by the conference participants is that DyCoSS was very successful and well organized. It attracted an unexpectedly large number of scientists from all over the world, and provided interesting forum for research in the field.

It is possible to conclude that IAA Conference on Dynamics and Control of Space Systems contributed to intensive discussions of the modern research, dissemination of the up-to-date information in the area and better contacts between the members of Space Systems scientific community. DyCoSS found its place in the tight calendar of the events in Space Systems and we are confident that this first edition will be followed in the near future by the respective series of DyCoSS conferences.

DyCoSS Co-Chairs

Dr. Anna Guerman
Corresponding Member of IAA
Associate Professor, University of Beira Interior
Coordinator of the CAST
Caldada Fonte do Lameiro, 6201-001 Covilha PORTUGAL
e-mail: anna@ubi.pt

Dr. Peter M. Bainum, P.E.
Member IAA
Distinguished Professor of Aerospace Engineering, Emeritus
Dept. of Mechanical Engineering of Howard University
Washington, D.C. 20059
e-mail: pmbainum@gmail.com