

# A BRIEF HISTORY OF SPACEOPS – the Early Years

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In the glow of the recent success of the 11th SpaceOps Conference in Huntsville, Alabama, Joachim Kehr and Dave Linick were reminiscing about the formative years of SpaceOps when they came to the realization that there are few people around who still remember how SpaceOps got started and who can recall its early history. Joachim and Dave have been involved in SpaceOps since its beginning; Dave has attended every Conference and Joachim has missed only one. Both have served continuously on a SpaceOps Committee since the inception in 1992. They speculated that no one else has such a long background with SpaceOps and if they didn't document the history, it would be forgotten. This realization led to the article that follows.

We, Joachim and Dave, have documented the early history as best we can recall. Time has a way of dulling the memory, so we take responsibility for any errors that exist in this narrative. However, we also take comfort in realizing that there are few still around who are old enough to be able to contradict us.

## An Idea was Born

In late June of 1990, the European Space Agency (ESA) organized a symposium on "Ground Data Systems for Spacecraft Control." The symposium was held at the Maritime Konferenzzhotel in Darmstadt, Germany and was managed by the European Space Operations Center (ESOC). Mike Jones, from ESOC, was the Symposium chair. Although no one realized it at the time, this turned out to be the first SpaceOps Conference.

The story of SpaceOps actually began a few years earlier. Dave Linick was working in the field of mission operations at NASA's Jet Propulsion Laboratory. He observed that there were many opportunities for people in the space business to attend conferences and exchange ideas, but noted that very few included topics related to ground system development or mission operations. It seemed to him that even the most arcane and specialized disciplines related to building spacecraft had their own societies, annual conferences, logos, coffee cups and secret handshakes, but the operations field, which comprises thousands of people from around the world, was largely unrepresented. From this, an idea was born.

Dave then began discussing with his colleagues at JPL the possibility of creating a community forum for people engaged in mission operations, with regularly scheduled conferences for exchanging technical information. Although this idea was widely endorsed, the press of normal work slowed progress. Then, in early 1990, the announcement for the ESA Conference in Darmstadt was circulated. Dave, along with three hundred other ground system and operations personnel from around the world, signed up to attend.

The Conference was quite a success. Many of the attendees remarked that they were pleased and surprised to learn that other people, in other Centers and Agencies, were dealing with problems that were similar to theirs and spoke a similar vernacular. It was as if they had stumbled upon family that they never knew they had.

However, ESOC had planned this as a singular event; there were no plans for it to become a regularly scheduled Conference. So, Dave met with Mike and they discussed Dave's idea for creating a recurring conference for the operations community. They introduced this idea to their respective Center management and after some negotiation, JPL and ESOC agreed to cooperate in creating an ongoing operations forum.

## SpaceOps #1 (or was it #2?)

The two Centers agreed that the next step would be for JPL to host a Conference in Pasadena, California, in 1992. The technical planning committee was to have international involvement, a decision which turned out to be a key to future success. In this instance, the planning for each session of the conference was managed by a local NASA- JPL chair and co-chaired by a volunteer from a different space agency. As a result, the Conference took on a truly international flavor far beyond ESOC and JPL, with papers being presented from all over the world.

Per the JPL-ESOC agreement, the formal name for the Conference was "The International Symposium on Ground Data Systems for Space Mission Operations." This name was not very convenient for brochures, logos, and the like, so the term "SpaceOps" was adopted as the informal name.



The first SpaceOps logo (1992)

SpaceOps 1992 was a great success with over 135 presentations and 400 attendees from 14 countries. These first two successful operations conferences validated the notion that a need was there to be filled. In addition, these two symposia established many of the conventions and traditions that still define much of SpaceOps – biannual conferences, a highly international flavor, full panel sessions with invited keynote speakers, multiple parallel tracks, four full conference days, on-site hosted lunches, a gala dinner, and a social event highlighting the local culture. For SpaceOps 1992, the social event included filming a simulated Star Trek television episode at Universal Studios with many of the world's noted operations managers overacting their parts in starring roles.

## The Founding Act and the SpaceOps Committee(s)

During the Conference at Pasadena, on November 19<sup>th</sup> 1992, a meeting was convened with interested Conference participants by interim chairs Giulio Varsi and Dave Linick (both from JPL), to consider the formation of a permanent SpaceOps Committee. The goals were to organize future SpaceOps Symposia and to promote an international community in space operations comprising agencies, academia and industry. The participants representing their agencies expressed unanimous approval for the proposed formation of the committee.

The founding meeting participants were:

JPL:	Giulio Varsi, Dave Linick, Valery Altunin, Garry Burdick, Judy Cobb, Ek Davis,
ESA/ESOC:	Kurt Heftman, Peter Beech, Kurt Debatin, George Delmas, Carlo Mazza, Dave Wilkins
CNES:	Roland Ivarnez, R. Simon Pons,
NASA/HQ:	John Rodgers

NASA/GSFC: Dolly Perkins  
NASDA: Akkio Yamamoto  
GUS: Konstantin G. Sukhanov, Lavochkin Assoc.  
DLR/GSOC: Joachim Kehr

D. Wilkins from ESOC expressed the desire for a journal or a professional forum in analogy to IEEE. It was decided that, even though the issuance of a professional publication is an important function of the committee, it would be too early to plan for it.

Important to the future of SpaceOps was that during the meeting several participants expressed their desire to be hosts of the next Symposium (ESOC, CNES, and GSFC). Therefore, the first order of Committee business was to select a host for SpaceOps 1994 and that honor went to CNES. (A few weeks later, CNES had to withdraw its bid and the Goddard Space Flight Center was selected as host for 1994.) The second order of business was, as for any good Committee, to establish a subcommittee. This subcommittee was formed to develop a governance model for SpaceOps. It was a three person subcommittee whose members were Peter Beech (ESA/ESOC), Roland Ivarnez (CNES) and Dave Linick (NASA/JPL), to be supported later, and very diligently, by Joachim Kehr (DLR/GSOC). Now much older, the latter two are the humble authors of this reminiscence.

Over the next few months, the governance model emerged, titled: "Charter – International Committee on Technical Interchange for Space Mission Operations and Ground Data Systems (also known as SpaceOps Committee)". Most of what was defined remains today, including the dual committee structure (the smaller Executive Committee, which has decision authority, and the larger Committee-at-Large, which accomplishes studies and provides advice and recommendations), the process for admitting agencies for SpaceOps membership, the assignment of chairs for the two Committees, and the selection of host agencies for the Symposia.

Although the idea for a SpaceOps publication had been postponed, it was not forgotten. In 2002, during the Symposium at Houston, the SpaceOps Committee joined forces with AIAA and its Space Operations Support Technical Subcommittee (SOSTC) and established the joint on-line journal for space operations called the "Communicator" to finally fill the need for the publication of articles, operations best practices and other relevant documentation as well as the publication of peer reviewed technical and scientific papers.

## 20 Years of SpaceOps

In addition to the first two Conferences described above the following SpaceOps Symposia have taken place:

1994	NASA, GSFC Greenbelt/Washington DC.
1996	DLR/ESA, GSOC Oberpfaffenhofen/Munich
1998	NASDA, JAXA Tokyo
2000	CNES, Toulouse
2002	NASA, JSC Houston
2004	CSA, Montreal
2006	ASI, Rome
2008	ESA/ESOC, Heidelberg
2010	NASA/MSFC, Huntsville

The SpaceOps 2012 Conference will be hosted by GSOC, in partnership with the Swedish Space Corporation (SSC), and will be held in Stockholm, Sweden from June 11 to June 15, 2012.

### - and Still Going Strong.

SpaceOps, as a Conference and as an Organization, continues to mature. Attendance at the Conferences has continued to rise, paper quality is high, the Conferences are professionally organized and executed, a vibrant poster session has been instituted, and selected papers are compiled into published books. (SpaceOps 2010, hosted by NASA's Marshall Space Flight Center in Huntsville, Alabama, had 810 attendees from 27 countries, 306 papers and 48 posters.) The number of agencies and countries that have become members of the SpaceOps organization has grown significantly. Industry involvement has greatly increased. The participation of academic institutions and students has begun to gather momentum. SpaceOps has instituted a prestigious awards program. In addition, the SpaceOps organization continues to expand its contributions to the field in other ways – including electronic periodicals, like the Communicator, and workshops on selected topics. In summary, SpaceOps has become the premier professional organization in its field.



[Current SpaceOps Logo \(2010\)](#)

Ultimately, the success of SpaceOps has depended on the hard work and dedication of its volunteers – those who serve on the SpaceOps Committees and those who organize and manage the Conferences. We, Joachim and Dave, agree that working with those dedicated operations experts, and sharing experiences with this international community, have been among the most satisfying, educational, and enjoyable experiences of our careers. We wish for SpaceOps a long and productive life!

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### Annex: "The Journal of Space Operations & Communicator" (added in August 2015)

The following article describes the evolution of the SpaceOps online "Journal" and was added to complete the SpaceOps history.

In 1994, the founders of the SpaceOps Organization started to use the fledgling Internet to put papers from the SpaceOps '94 conference (in Greenbelt, Maryland, USA) in the so-called SpaceOps Electronic Publishing System (EPS) [1]. Then two years later, things progressed and papers from the Munich SpaceOps '96 Conference SpaceOps were made available on the DLR/ESA sponsored SpaceOps internet home pages as well as distribution via CD.

Since its inception, the SpaceOps Organization always planned to have an electronic publishing scheme for conference papers along with

other cutting edge articles “in between” the biennial conferences. An opportunity arose when the SpaceOps Organization and the AIAA Space Operations Support Technical Committee (SOSTC) signed a cooperation agreement to coordinate their activities. The SOSTC had an AIAA hosted online publication webpage called “The Space Operations Communicator” and it was agreed to share the publication webpage between the two organizations. Then, in 2003 a new secure domain was set-up outside of AIAA. A new layout and structure was jointly defined and the implementation was performed by an experienced web-design contractor and GoDaddy services - and was sponsored by the ASRC Aerospace Corporation. The name of the “Communicator” was changed to “Journal of Space Operations & Communicator” (abbreviated the “Journal”).

Both SpaceOps and SOSTC share a common goal for the “Journal”, from the SpaceOps charter to “foster continuous technical interchange on all aspects of space mission operations and ground data systems, and to promote and maintain an international community of space operations experts from Agencies, Academic Institutions, Operators and Industry” and the SOSTC’s motto “Evolving communication, Advancing space operations, Saluting the Pioneers”.

**The "Journal" offers publication opportunities for:**

- \* Technical Papers
- \* Technical Articles and Interviews
- \* Book Reviews
- \* SpaceOps News articles including the publication of conference presentations in Power-Point format
- \* "Pioneers" section which features important (historical) space developments
- \* Quarterly poll on the latest space related issues.

A highly qualified expert team is available for the peer-review of technical papers. The "Journal" has a registered ISSN number (ISSN 2410-005) and is also registered with the internationally renowned "ResearchGate" organization.

All articles and papers are archived, and a search engine allows for the quick location of "Back Issues". A standardized (AIAA) template is available for publishing of papers in the "Journal" along with a submission procedure (see "Downlink" on the home page).

**Links from the "Journal" are provided to:**

- \* The "SpaceOps Wiki", which categorizes important papers from all SpaceOps Conferences according to key-words. This allows the quick location of papers "pushing the envelope" of space operations techniques. The SpaceOps Wiki features a direct link to the official SpaceOps archive, hosted and maintained by the AIAA Aerospace Research Central archive (ARC). All SpaceOps conference papers can be downloaded from the archive.
- \* SpaceOps Organization home page
- \* AIAA and SOSTC home pages as well as the AIAA Aerospace Research Central archive (ARC), the world's #1 source for aerospace information
- \* Facebook SpaceOps page, updated on a regular basis
- \* LinkedIn SpaceOps page conference and workshop dates, or SpaceOps award nominees.

The SpaceOps facebook and LinkedIn pages also give announcements of important SpaceOps and SOSTC activities, e.g. the next conference and workshop dates, or search for SpaceOps award candidates.

The "Journal" has been online for over 12 years, and has a quarterly audience of between 500 to 700 international readers. The "Journal" provides an excellent opportunity for sponsorship - described in "Sponsorship" (see home page).

The SpaceOps Organization is a non-profit organization and is open to all qualified agencies, industry or academia engages in the field of space operations.

[1] Reference::[https://www.researchgate.net/publication/277076082\\_SpaceOps\\_Electronic\\_Publishing\\_System\\_\(EPS\)](https://www.researchgate.net/publication/277076082_SpaceOps_Electronic_Publishing_System_(EPS))

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