



Report to SPC for the period 2007-2009 and Future Perspectives for 2010-2012

Purpose

This document is written in support of the request to ESA SPC for a continuation of the funding of the International Space Science Institute in the period 1/1/2010-31/12/2012. It describes the evolution of ISSI since the last evaluation by the SPC in 2006, its present status and the future perspectives for the next funding period.

1. The SPC evaluations of ISSI from 1998 to 2009

The first evaluation of ISSI by the SPC (and the Council) was conducted in 1998 based upon the report of an Evaluation Group chaired by Lord Martin Rees. The outcome was very positive and continuation of the funding was granted until December 2003. In particular, the Evaluation Committee strongly recommended ISSI to “extend its activities to the basic science part of Earth Observations from space”, provided additional resources would be found. This recommendation as of late has been implemented, as this report will describe.

Subsequent evaluations were conducted by SPC in 2003 and 2006. They both were based on reports prepared by ISSI on the development and significant evolution of the Institute in the intervening periods. These reviews were successful. In 2006, the SPC agreed to continue supporting the activities of the Institute from 1/1/2007 to 31/12/2009 at the level of 1.1 M€ per year (2006 EC), updated according to the rules applicable to the Science Programme budget. The fourth evaluation will be based on the content of this report.

2. Brief historical overview and short presentation of the Institute

2.1 The organs of ISSI

ISSI was established in Bern, Switzerland, in March 1995 as a Foundation under Swiss law by, and with an endowment from, the aerospace company Oerlikon Contraves AG (now restructured under the name Oerlikon Space AG).

The *Founder* Contraves AG, the European Space Agency, the Swiss Confederation, the Cantonal University of Bern and the Swiss National Science Foundation have, since the beginning, provided financial and “in kind” support to ISSI.

The **Board of Trustees**, composed of representatives of the Founder, the funding agencies, and of leading scientists from the international community, decides on matters not delegated to other bodies, including those concerning the administration of the Foundation and the Foundation's capital. The list of members is given in **Annex 1**.

The **Directorate** is the organ responsible for the scientific and administrative management of the Institute. It is composed by up to four Directors among which the Board of Trustees names the Executive Director. In the period 1996-2002, the Executive Director was Professor J. Geiss (CH). Since January 2003 that function has been assumed by R.M. Bonnet (part-time). A small number of employees does cover scientific, managerial, technical and administrative functions (some, part-time) and complete the personnel at ISSI. The list of ISSI personnel is given in **Annex 2**. The relatively high number of Directors is justified with regard to the variety of scientific areas covered by the Institute and by the large numbers of individual scientists coming to work at ISSI every year (620 in the 13th year).

The **Science Committee** provides advice on all scientific matters to both the ISSI Directorate and the Board of Trustees. The Science Committee is in particular responsible for the assessment and grading of the scientific projects making use of the tools of ISSI (see Section 2.2). It is most active and plays an essential role in the competitive assessment of the International teams proposed in response to an annual Call for Proposals issued every January. The Committee also evaluates, at the request of the Executive, proposals for Workshops emanating from the community and from Europlanet (Section 3.3). The Committee discusses also matters pertaining to the Forum, Working Groups, and any other scientific issue that ISSI wishes to consider. Thereby, the Science Committee ensures consistency in the scientific conduct of the multiform activity of the Institute. The present membership of the Committee is given in **Annex 3**.

2.2 The tools of ISSI

The scientific activity at ISSI is realized through a set of 5 different tools proper. However, as one fundamental characteristic of ISSI is its flexibility, new tools might be introduced whenever necessary in order to adapt to the evolving needs and offer the best service to the international scientific community.

Workshops

Objectives:	Address a wide scientific area .
Initiation:	Directorate (we discuss below possible inputs from the scientific community)
Selection:	Directorate, following consultation of the Science Committee
Working procedures:	Determined by WS conveners
Time frame:	One week (possibly repeated)
Output:	Book in Space Science Series of ISSI, reprinted from volumes of the journal Space Science Reviews
ISSI support:	per diem and accommodation in Bern
Travel support:	Up to now granted to the WS conveners and editors

International Scientific Teams

Objectives:	Scientific Research on specific topics addressed through a series of meetings
Initiation:	Community, through annual Calls from ISSI
Selection:	Open competition, through reviews and grading by the Science Committee. Final decision by the Directorate.
Working procedures:	Autonomous
Time frame:	< 2 years
Output:	Papers in scientific journals, with acknowledgement to ISSI
ISSI support:	per diem and accommodation in Bern
Travel support:	Only to the Team Leader

Working Groups

Objectives:	Address topics of a technical or an applied nature usually of general interest to large branches of the science community. They fulfil the role of a service to the community .
Initiation:	Directorate
Selection:	Directorate
Working procedures:	ISSI leader or external leader
Time frame:	As necessary
Output:	Book in ISSI Scientific Report Series
ISSI support:	per diem and accommodation in Bern
Travel support:	Leader and occasionally participants

Visitors

Initiation:	Directorate and external scientists
Selection:	Directorate
Objectives:	(Specific to visitor)
Working procedures:	Autonomous
Time frame:	As necessary
Output:	Publication/Management task
ISSI support:	per diem and accommodation in Bern
Travel support:	No, in principle (exceptions, if need be)

Forum

Initiation:	Directorate
Selection:	Directorate (Science Committee consulted)
Objectives:	Open debate
Working procedures:	Direction
Time frame:	~2 days
Output:	Depending on the issue addressed
ISSI support:	per diem and accommodation in Bern
Travel support:	If need be

The Alpbach Summer School

ISSI is a partner of the Aeronautics and Space Agency (Austrian Research Promotion Agency, FFG) in the organization of, and the support given to the Alpbach Summer School. ISSI directors are called upon to participate in the Programme Committee of the School, as Tutors or Head Tutors (A. Balogh 2008 and 2009), as Jury members and as Lecturers. Through its involvement in the Europlanet Consortium, ISSI will also support one Summer School dedicated to planetology in 2012.

2.3 The ISSI web site www.issibern.ch

Since May 2008, ISSI has a new web site. The web site is split into six main fields:

1. About ISSI,
2. Program,
3. Publications,
4. Local Guide,
5. Association Pro-ISSI and the
6. Spotlight

The Spotlight presents the latest news, upcoming meetings and events, latest publications or other activities of ISSI staff members. The web site is regularly updated.

3. Evolution in the period 2006-2009

In the period 2006-2009, the activities of ISSI have intensified and were characterized by an increasing number of participants that evolved from a total of 1400 (2006) to 2200 (2009), i.e. a 57% increase, and by the introduction of two new programmes, in *Planetary Science* and in *Earth Sciences*, in addition to the traditional mainstream programme. Noteworthy is the participation of scientists from China (see Table 4.4).

Of considerable political relevance has been the offer from the *Russian Academy of Sciences* to establish a formal cooperation with ISSI that would include an annual financial contribution of some **35,000 Euros**.

In the operational area, the introduction of a *Young Scientists* programme line directed towards the new generation has met with considerable success.

In analogy to what was done in 2003, a brainstorming session involving ISSI and a selected group of scientists plus the representatives of the Swiss Space Office and ESA (D/SRE and D/EOP) was held in April 2007 to take stock of the evolution of the Institute and discuss new promising venues and the perspectives of its future evolution. The issues addressed concerned the strategy for the selection of Workshops, the potential role of ISSI in the Earth Sciences and the stability of future funding. Critical developments occurred in the following years in all three directions. These are reported below.

3.1 The mainstream programme

The mainstream programme is financed through the traditional annual contributions of the ESA *Directorate of Science and Robotic Exploration* and those of the *Swiss Space Office (SSO) of the Swiss Confederation*, as well as of the *Swiss National Science Foundation (SNF)*. It covers activities executed with the tools described above in Section 2.2 in the field of space science. The evolution of ESA's financial support to the mainstream programme is given in Section 8 together with those of other sources of funding.

Workshops and Working Groups

Ten Workshops were held in the period 2006-2009:

- Mercury (2006)
- Composition of matter (2006), jointly with the ACE Science Team
- Origin and early evolution of Comet nuclei (2006)
- Comparative Planetary Aeronomy (2007)
- Planetary Atmospheric Electricity (2007) jointly with *EuroPlaNet*
- From the Outer Heliosphere to the Local Bubble (2007)
- Origin and Evolution of Solar Magnetism (2008)
- Planetary Magnetism (2008)
- Nature of Gravity (2008)
- Exchange Processes in Icy Moons (2008) jointly with *EuroPlaNet*
- Terrestrial Magnetism (2009)

Four Working Group were operative in this period:

- Photons in Space
- Collisionless Shocks in the Heliosphere
- Cross-calibration of past FUV experiments
- Venus Climate

Eleven books of the *ISSI Space Science Series* were published by Springer in 2006-2009 (*Annex 4*).

International Teams

A total of 116 proposals were received in response to the 2006-2007-2008 Calls, of which 61 were approved for implementation, with a success rate of 53%. At the time of writing this report, the reviewing and selection process of the 2009 Call, for which the record number of 64 proposals has been received, is on-going. Table 3.1 and Figure 3.1 give the details of the evolution of this tool. Particularly impressive are the figures for 2009.

In the course of the past three years, the Teams met repeatedly at ISSI, requesting between 43 and 52 weeks per annum for their meetings. While the 2006 batch of selected Teams (17) have, by and large, completed the work, and the 2007 batch (24) are in the run-down phase, the 2008 batch (20) is in full progress. An average of 80-90 peer reviewed scientific papers per year testify of the scientific output of the Teams' activity.

Table 3.1 The six years statistics of the Teams activities since 2003

Year	Letters of intent	Proposals	Approved
2003	35	33	12
2004	30	28	16
2005	53	44	18
2006	42	35	17
2007	50	51	24
2008	30	30	20
2009	70	66	to be selected

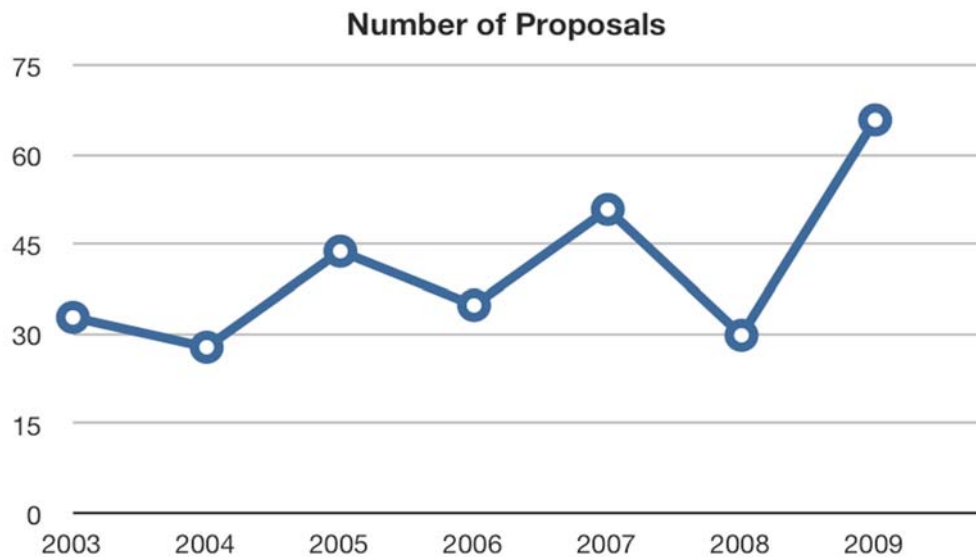


Figure 3.1: Number of submitted proposals since 2003 in response to the Calls. The two years periodicity between maxima and minima may be explained as the result of a recurrent involvement of scientists every other cycle. A detailed review of this feature is in process. Nevertheless, the numbers averaged over two years show a continuous increase.

Forum

Four such events were organized:

- Earth Sciences from Space, March 2006
- Space Science and Education, June 2007
- The Future of Magnetospheric Research, March 2009
- Forum on the Earth Science Programme, May 2009

The debates of each individual Forum are published as internal ISSI reports which are distributed to all participants and are available to non-participants upon request.

Guests and visiting scientists

In total, 18 guests and visiting scientists have been invited to ISSI in the past three years for periods varying from a few days to a few months. Their list is given in *Annex 6*.

3.2 The new Earth Science Programme

The suggestion to consider branching out in the domain of earth sciences was made as early as 1998 by the Evaluation Committee of Lord Martin Rees. That was strongly supported in a brainstorming meeting in Beatenberg in January 2003 and by the Forum organised in March 2006 which discussed whether ISSI might and should be involved in, and what added value it would bring to this discipline.

This new programme was established formally on 1 January 2008, following a preparatory period of about a year, during which the foundations were laid down. It is based on a *contractual relation with ESA-D/EOP*, whereby the latter funds ISSI to conduct over thirty-six months a series of activities in the framework of the *International Polar Year (IPY)*. It includes ESA selected IPY projects, ISSI International Teams and three Workshops, jointly agreed upon between ESA-D/EOP and ISSI. A total sum of *470,000 Euros* has been granted by *D/EOP* to ISSI to cover the expenses related to this new programme.

The programme is split in two phases, separated by the *Forum* held in May 2009, during which the results of the first phase were discussed. A decision on the continuation until the end of 2010, and on the contents of the second phase, was agreed upon. For the management of this programme, ISSI recruited a *fourth Director* (part-time) and a *Post-doc*.

This is the first time that ISSI enters into a formal contractual relation for the execution of a full programme in Earth sciences. This was considered to be the most practical way to acquaint the Earth Science community with ISSI, while at the same time assessing the value added by ISSI to the scientific endeavours of that community.

As a consequence of that new activity, and of the relation to the ESA- D/EOP, ISSI was successful in obtaining an adequate increase of its annual financial contribution from the *Swiss Confederation*, a move that the Institute gratefully acknowledges. As a result of these commitments, the new Earth Science 36 month's programme is entirely funded from contributions additional to those of the mainstream programme (Table 8.1).

3.3 The EuroPlaNet (EPN) initiative

EPN consisted initially of a Consortium of about 60 planetary science European laboratories, funded by the EU/EC within its Framework Programme 6 (2005-2008). Within that context, back in 2006, EPN solicited the support of ISSI for the selection and conduct of two Workshops in 2007 and 2008, (see the list under Section 3.1). The

funding of that activity, including the ISSI books issued by each Workshop, was shared in the proportion 1/3 ISSI - 2/3 EPN. Through that involvement, ISSI was able to expand its Workshop activity at a reduced financial investment.

As that experience was considered satisfactory for both parties, it has been agreed that ISSI should participate as a full partner in the new Europlanet proposal submitted to the EU/EC within the 7th Framework Programme (2009-2012). However, unlike the arrangement of 2007/08, ISSI would now become a full partner and will be directly funded by the EC.

That proposal was approved by the EU/EC and started on 1.1.2009. The task of ISSI in this new agreement will be, again, to select and conduct an annual Workshop (4 in total) and publish the related Books. In addition, ISSI will be tasked with the organization of one Summer School in connection with the *Alpbach Summer School*. The first Workshop of this series has already been selected by the ISSI Science Committee in January 2009 and is entitled: *Quantifying the Martian Geochemical reservoirs* (Table 7.1).

The contract with the Commission adds an amount of ~**195 k€** to the ISSI budget over the 4-year period 2009-2012 (Table 8.1), through which the Workshops, their respective books and the Summer School will thus be financed outside of the mainstream programme.

3.4 The Young Scientists line

This new initiative which started in September 2007 is meant to foster the participation of young scientists (within about 2 years of the PhD) in ISSI's scientific activities, in particular in Teams and Workshops. From the time of inception, 124 individual young scientists participated in about 40 Teams and 3 Workshops.

4. Involvement of the international scientific community in the Institute (up to 30/6/2008)

4.1 Individual participants

The set of figures and tables included in this section illustrate the evolution of the annual number of individual participants in ISSI's activities since its inception, their geographical distribution and distribution among the tools. The aggregate number of individual participants reached a total of 2199 at the end of the 13th year (June 30, 2008).

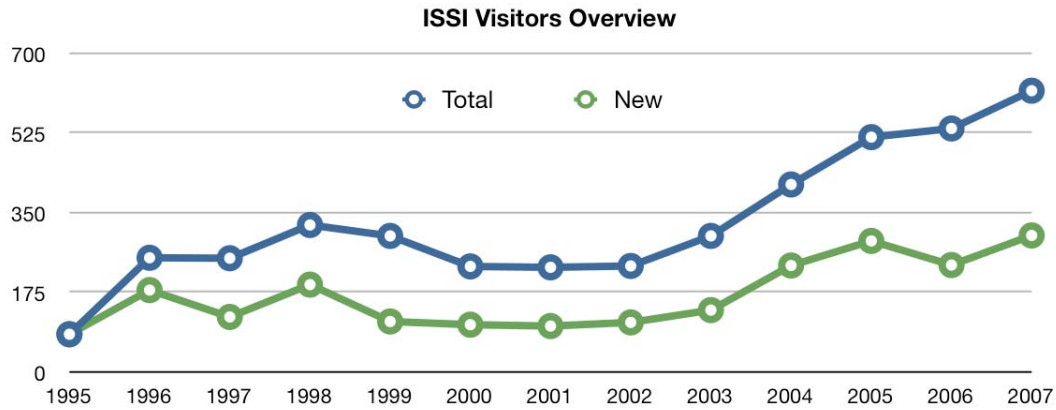


Figure 4.1: Overall number of visitors of ISSI per business year, all activities included (business years extend from 1 July to 30 June (e.g.: 1/7/2007-30/6/2008)). Following a steady increase after the start of ISSI, the number of visitors started to decline and to stabilize at about 230 per year. The steady increase in the last six years coincided with the introduction in 2003 of the annual Call for International Teams open to the community at large. The line “New” shows the number of “first-time-at-ISSI” visitors. It can be seen to be stable around 50%.

Table 4.1: Gross geographical distribution of ISSI scientific participants

ESA members	1302	USA (incl. NASA)	624
Central Europe	42	Japan	57
Other Contributors	73	Russia	101
Grand Total: 2199 participants			

Table 4.2: Distribution between ESA Member States and ESA Labs.

Austria	27	Greece	7	Portugal	12
Belgium	37	Ireland	6	Spain	39
Denmark	24	Italy	85	Sweden	41
Finland	30	Luxembourg	1	Switzerland	144
France	265	Netherlands	43	United Kingdom	193
Germany	276	Norway	19	ESTEC/ESRIN/.....	47
		CERN/ESO	6	Total	1302

Table 4.3: Central Europe

Bulgaria	1	Hungary	6	Serbia	1
Croatia	1	Estonia	1	Slovakia	3
Czech Rep.	13	Poland	13	Ukraine	3
				Total	42

Table 4.4: Other contributors

Argentina	2	Georgia	1	South Africa	8
Australia	6	India	3	Turkey	2
Brazil	5	Israel	10	Uruguay	1
Canada	19	Mexico	3	Unit. Arab. Em.	1
China	10	N. Zealand	2	Total	73

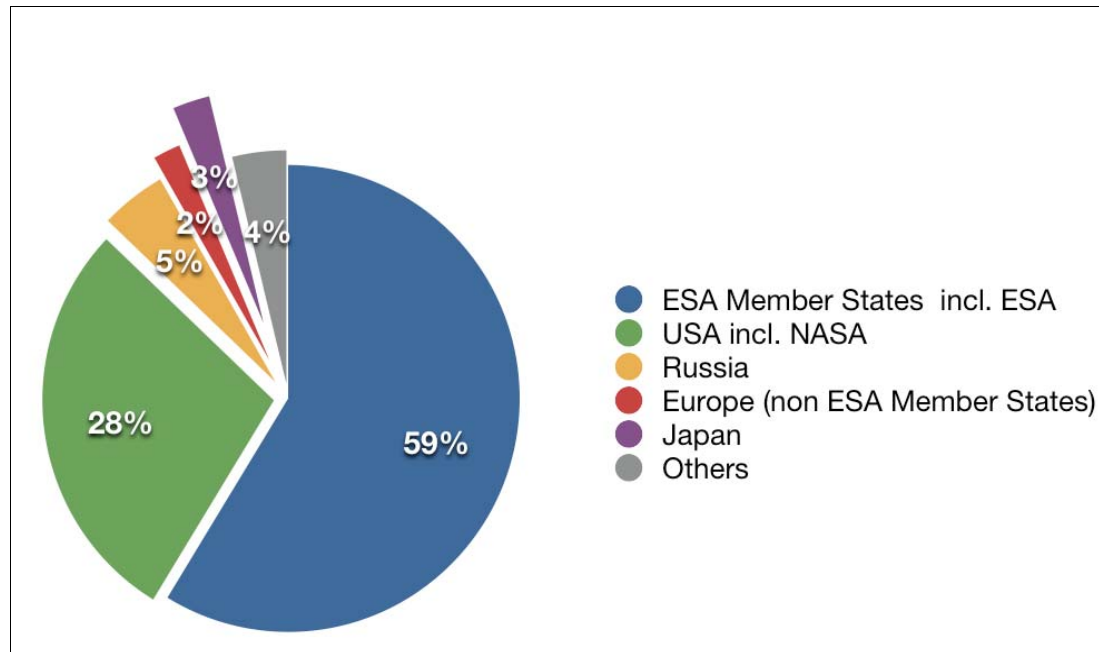


Figure 4.2: Distribution of nationalities over the first 13 years

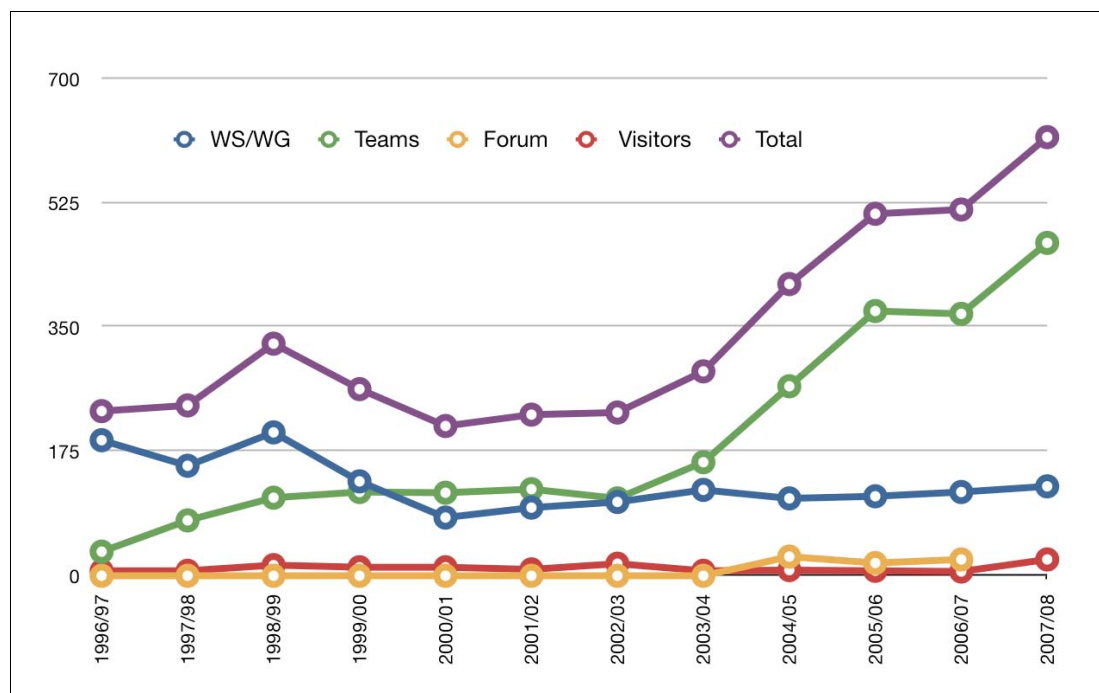


Figure 4.3: Repartition of the number of participants among the different tools of ISSI

5. ISSI Publications

5.1 ISSI Space Science Series

The scientific output (the product) of Workshops results in a book of the *ISSI Space Science Series* published by Springer. These have gained throughout the years, the status of reference books in their respective discipline (see Section 5.2). They also are published in *Space Science Reviews*. All articles or chapters are peer reviewed. *Annex 4* gives the updated list of the ISSI SSS.

The Working Groups' scientific output results in a book of the *Scientific Report* series (SR) published by the ESA Publication Division. *Annex 5* lists the issues published in that series since 1998.

There is no equivalent to the ISSI SSS for the publications of the International Teams. Teams' activities are published in peer-reviewed papers in the appropriate scientific literature. Some can be extended review papers. On average, there are 80-90 papers per year resulting from the Teams' activities.

5.2 Impact factor

We have analysed the citation statistics of papers in volumes of the Space Sciences Series of ISSI. Using the official information on the ISI Web of Knowledge (available at www.isiknowledge.com) we have determined, for each volume, the average number of times each paper in the volume has been cited (note that this is not identical to the impact factor, which only counts citations in a two-year period). The result is given in *Annex 4*, both for 2005 (as already given in our 2006 report to the SPC) and for 2009. It is evident, particularly from the 2009 numbers, that papers in ISSI volumes are cited highly. This underlines the fact that ISSI volumes are indeed perceived as useful references to the status of a particular field. At the same time, the impact factor of the journal *Space Science Reviews* (from which the ISSI volumes are reprinted) for 2007 has risen to 2.954, a more than twofold increase from three years before. This fact, to which ISSI volumes have contributed significantly, was noted very favourably by the publisher.

6. Outreach activities

Outreach activities and tools are there to attract the attention of the broad science community and the public. In that respect, *Spatium*, the journal published by the *Pro-ISSI* association, thanks to its general character, addresses the public at large and is able to fill gaps in the process of popularising space science. Recently, the Pro-ISSI association published *The Fascination of Space Science* (edited by Hansjörg Schlaepfer). This book contains all issues of *Spatium* published during the first ten years of its existence. It aims at conveying the results of space research to the wide public. The text covers the main activities in line with ISSI's scientific programme. The authors are international leading scientists. The language is easily understandable by non-experts, while scientifically accurate.

Every year, ISSI publishes its annual report which is directly accessible in PDF format from the ISSI web page.

ISSI also regularly updates and maintains its active web page accessible at: www.issibern.ch. Figure 6.1 illustrates the evolution in the number of hits to the web page since January 2005.

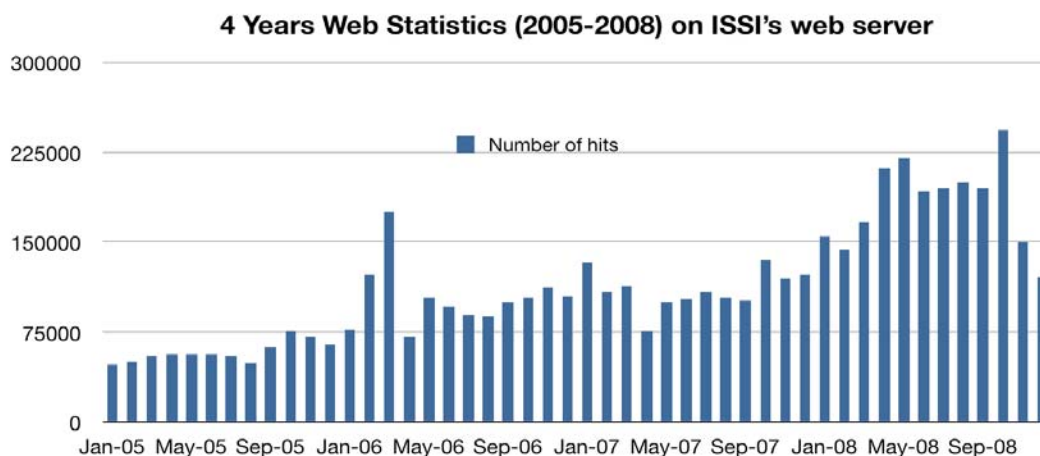


Figure 6.1: Four years of ISSI web site hits. It is to be noticed that since May 2008, ISSI has a new web site

7. Outlook to the future

Confronted with the results outlined above, there is at present every reason to expect a continued, sustained, interest of the scientific community in ISSI. The tools of ISSI appear to be well adapted to the multiform needs of that community. We review here the foreseen evolution of these tools.

7.1 Workshops: towards a more bottom-up oriented approach

Workshops have been the stable reference tool throughout the lifetime of ISSI. On average three Workshops are carried out annually. However, the outlook to the future indicates an increasing number, due to the new programmes (see Table 7.1). One EuroPlaNet Workshop per year will be organized by, and held at ISSI, directly financed by the EU/EC. In addition three Workshops are planned until end 2010 organised and funded from within the new Earth Science Programme.

The Workshops are highly praised by the scientific community which expresses an increasing aspiration to directly contribute ideas and proposals. A bottom-up approach as is followed for the International Teams (see Section 7.2 below) is more delicate to implement here, given the small number of Workshops (relative to Teams) ISSI can implement annually. Appropriate measures to that effect are however being discussed within ISSI and by the Science Committee with the preoccupation not to cause unnecessary frustration (see Section 7.4). The successful and productive experience of

Europlanet whereby a menu of workshops emanating from the planetary community is proposed to the Science Committee for prioritization, is offering an example that could be implemented also for other disciplines in the main stream program. In the near future, a more intense activity is foreseen as indicated above. Seven workshops are planned in 2009 and 2010:

1. Comparison of the plasma-spheres of Mars, Venus and Titan (*EuroPlaNet*) (end 2009)
2. Multi-scale physics in coronal heating and solar wind acceleration (January 2010)
3. Magnetic fields in the Universe (1-5 March 2010)
4. Earth's Cryosphere and Sea Level Change (*Earth sciences*, 22-26 March 2010)
5. Cosmic Rays in the Heliosphere II: Spatial and Temporal Variations (April 2010)
6. Earth's Energy and Radiation balance (*Earth sciences*, late 2010)
7. Energy and Momentum Coupling between Earth's Atmospheric and Plasma Environments (late 2010)

7.2 International Teams: the bottom-up approach

This increasingly popular tool is receiving attention also from new communities, such as the Earth Sciences. It is implemented using a bottom-up approach through a single annual call for proposals regrouping all disciplines. At present the Teams represent more than 75% of ISSI's activities. The procedure consisting of a series of meetings over an extended period of up to 24 months, with work been done in between, gives the Team a high degree of efficiency and flexibility. The proposals received in response to the Call are evaluated and graded by the Science Committee. An average of 20 new Teams per year has been sustained by the mainstream programme. The outlook is promising as shown in Table 3.1 and Figure 3.1. In view of the excellent results achieved through this tool so far, no changes in the procedure are considered in the foreseeable future. However, a substantial growth in the annual number of accepted proposals cannot be envisaged as ISSI's staff and premises are already getting close to the saturation level.

7.3 Working Groups

This tool is available internally to study issues of general scientific interest to the community but unlikely to be proposed as candidates for Workshops and Teams. No change is planned for this tool. Four Working Groups are presently active (see Section 3.1 for the updated list).

7.4 Forum: a possible source of new Workshop ideas

The outlook shows an expanding interest for this tool both outside ISSI and internally. It allows in some occasions to establish contact with communities or individuals otherwise quite distant. The unbound free discussion is conducive to new ideas and concepts. This tool may become instrumental in the on-going discussion on the planning of Workshops (see above), as evidenced by the success of the *Forum on the Future of Magnetospheric Research* organized at ISSI on 23-24 March 2009, from which four proposals for future Workshops have been identified. In the near future, one Forum is already identified for mid-2010 in the field of *Earth Sciences* (see below 7.6)

7.5 The Young Scientists line

The outlook is very positive for this new initiative which had a successful start. Both Teams and Workshops gained in capacity and flexibility through it. Most, if not all, of the 124 Young Scientists that benefited from this scheme, appreciated the possibility offered to them to be in immediate contact with more senior scientists. The present ratio (YS to senior members) of 20% is considered satisfactory by the Teams and Workshop leaders. Through this scheme, ISSI is contributing to the rejuvenation of the scientific community in space and Earth sciences.

7.6 Earth Sciences

As indicated in 3.2 above, the present programme is run under a contractual agreement with ESA-D/EOP. This was made necessary by the fact that the main financial contributor to ISSI mainstream programme is the ESA-Directorate of Science and Robotic Exploration (D/SRE) that has no responsibility for the Earth Sciences. In consideration of this, the presently on-going contractual relation was established directly with D/EOP until end 2010.

In November 2008, a high level meeting between ESA/EOP and ISSI concluded that a *Forum should be organized in mid 2010*, with the aim of reviewing the progress made, the level of interest of the Earth Sciences community and the capacity of ISSI to meet their goals. On the basis of those findings the Forum should evaluate possible scenarios for ISSI and ESA to continue beyond 2010 through a formal association between the two institutions of a type similar, if possible, to that presently in force with the ESA mandatory science programme.

7.7 Europlanet

This four years programme, funded by the EU/EC is of great significance for ISSI. In the first place it will provide additional funds for the conduct of Workshops. Secondly it will make ISSI a full partner of a now respected European Research Infrastructure. At variance with this, but not against, ISSI because of its true international character will foster the involvement in the planetary research effort, without limitations of nationalities, of the best European and non-European scientists throughout the world.

The present involvement of ISSI can be seen also as a test case for similar initiatives to be opened in future Framework programmes of the EU.

8. ISSI financial situation

Table 8.1 shows the variation of ISSI's budget in the past years and its projected evolution over the next three years until 2012. No figures can be given for the contribution of ESA to the Earth Sciences budget beyond 2010. Similarly, a new contract with the SSO will have to be negotiated in 2011 for the continuation of funding beyond 2012.

Table 8.1: Evolution of the various sources of funding of ISSI

Year	ESA/SPC [k€]	ESA/EO [k€]	SSO [kCHF]	SNF [kCHF]	Europlanet [k€]	UoB
2003	1000		770	150		
2004	1000		775	150		
2005	1000		787	150		
2006	1050		799	150		
2007	1100		811	160		in kind
2008	1128		900	160		
2009	156	470	910	160		
2010	...		920	...	195	
2011	...	?	930	...		
2012	...	?		

9. Conclusions

This report, hopefully, has provided some ground to our belief that the ISSI concept has demonstrated its value over its 14 years of existence. ISSI has proven its loyalty to carefully implement the recommendations which resulted from the various reviews of its activities in 1998, 2003 and 2006. This successful result indicates that ISSI fulfils a real demand in space science, where no similar facility exists as yet. The interdisciplinary integrative approach, at the basis of ISSI, is increasingly recognized as crucial and pertinent to the acquisition of knowledge in particular from space research missions.

ISSI is presently articulating its activities within different programmes. What was in 2006, at the last review of the SPC, a single programme funded by ESA D/Sci (now D/SRE) and Switzerland, is now constituted of three programmes, each supported by separate financial resources. This has contributed strongly to the expansion of ISSI as

shown in the body of the report. It is to be noted that the diversification was achieved while strictly maintaining the scientific selection rules that apply equally to all three programmes, thereby guaranteeing a uniform approach throughout all activities and all three branches of science present at ISSI.

ISSI has achieved this expansion through different routes: politically through the likely agreement with the Russian Academy of Science; scientifically through the expansion of the number of participants (a factor 3 since 2003), programmatically through the Europlanet Research Initiative and the new Earth Science programme. ISSI successfully diversified its sources of funding while applying through the Science Committee, a uniform and rigorous scientific approach for the selection of its activities. This was achieved with a limited increase of staff and within the same premises as from the start of ISSI. This result was only made possible by the willingness of the Team leaders to take upon themselves the full organization of their Team and to be the sole focal point in relation to ISSI. ISSI is deeply appreciative for the high level of support and direct cooperation received from all its visitors.

10. Funding request to ESA

On the basis of the discussion above regarding the mainstream programme, and in recognition of the persistent and increasing pressure on ISSI from the community to further expand access to Teams, Workshops, and other activities, it seems justified to make a plea for *a modest increase of 150,000 Euros* above the level of 1.156 M€ (Table 8.1) presently granted by the SPC for 2009. This increase will allow the addition of about one Workshop (with its book) and of six International Teams per annum. We believe that this will indeed stretch ISSI's possibilities but will still be within the capacity of its staff and infrastructure.

It is therefore requested that the SPC agrees to continue supporting the activities of the Institute from 1/1/2010 to 31/12/2012 at the level of 1.3 M€ per year (2009 EC), updated according to the rules applicable to the mandatory Science Programme budget, following the granted new level of resources of that programme, i.e. incremented by 3.5% per year.

Annex 1: Members of the Board of Trustees

Simon Aegerter, **Chairman**, Wollerau, Switzerland

Hans Balsiger, **Vice Chairman** University of Bern, Switzerland

Lennard A. Fisk, University of Michigan, Ann Arbor, USA

Felix Frey, University of Bern, Switzerland

Daniel Fürst, Swiss Space Office, Bern, Switzerland

Claude Nicollier, EPFL/STI, Lausanne, Switzerland

Johannes Ortner, International Space University, Strasbourg, France

Risto Pellinen, Finnish Meteorological Institute, Helsinki, Finland

Klaus Pretzl, President of the Pro-ISSI Association, Bern, Switzerland

Hanspeter Schneiter, Oerlikon Space AG, Zurich, Switzerland

David Southwood, ESA, Paris, France

Lev M. Zelenyi, Russian Academy of Sciences, Moscow, Russia

Kathrin Altwegg is the **Secretary of the Board**, University of Bern, Switzerland

Annex 2: ISSI staff and Directors

Directorate

Prof. Dr. Roger Maurice Bonnet, Executive Director

Prof. Dr. André Balogh, Director

Prof. Dr. Lennart Bengtsson, Director Earth Science

Prof. Dr. Rudolf von Steiger, Director

Scientists

Prof. Dr. Johannes Geiss, Honorary Director

Prof. Dr. Michel Blanc, Discipline Scientist (Europlanet)

Dr. Silvia Perri, Post Doc

Dr. Angelo Pio Rossi, Post Doc

Dr. Symeon Koumoutsaris, Post Doc

Management and Administration

Andrea Fischer, Editorial Assistant

Dr. Vittorio Manno, Program Manager (until May 2009)

Saliba F. Saliba, Computer and System Administrator

Katja Schüpbach, Secretary

Brigitte Schutte, Secretary

Irmela Schweizer, Librarian

Silvia Wenger, Assistant to the Executive Director

Annex 3: Science Committee Membership

Len Culhane, **Chairman**, University College London, United Kingdom

Gerhard Beutler, University of Bern, Switzerland

Johan Bleeker, SRON Netherlands Institute for Space Research, Utrecht, the Netherlands

François Forget, University of Pierre and Marie Curie, Paris, France

Claus Fröhlich, PMOD Davos, Switzerland

John Harries, Imperial College of Science and Technology London, UK

Robert Kandel, Institute Pierre Simon Laplace, Palaiseau, France

Oleg Korablev, Space Research Institute, Moscow, Russia

Duccio Macchetto, Space Telescope Science Institute, Baltimore, USA

Atsuhiko Nishida, JAXA, Tokyo, Japan

Hermann J. Opgenoorth, ESTEC, the Netherlands (ex officio)

Tobias Owen, University of Hawaii at Manoa, USA

Götz Paschmann, MPI Garching, Germany

Reinhard Rummel, IAPG Technical University Munich, Germany

Monica Tosi, INAF Osservatorio Astronomico di Bologna, Italy

Rudolf Treumann, Ludwig-Maximilians-University, Munich, Germany

Annex 4: Titles of the Space Sciences Series of ISSI and citations of articles

The citations are based on Institute for Scientific Information (ISI) Web of Science. The two right-hand columns give the average number of times each paper in a volume has been cited from publication to 2005 (second column from right) and to 2009 (rightmost column).

#	Title	Editors	Year	Av. Cit. 2005	Av. Cit. 2009	Total Cit. 2009
1	The Heliosphere in the Local Interstellar Medium	R. von Steiger, R. Lallement, M.A. Lee	1996	3.9	24.4	950
2	Transport Across the Boundaries of the Magnetosphere	B. Hultqvist, M. Øieroset	1997	3.7	24.1	385
3	Cosmic Rays in the Heliosphere	L.A. Fisk, J.R. Jopikii, G.M. Simnett, R. von Steiger, K.-P. Wenzel	1998	3.8	21.4	386
4	Primordial Nuclei and Their Galactic Evolution	N. Prantzos, M. Tosi, R. von Steiger	1998	3.8	19.7	591
5	Solar Composition and its Evolution – from Core to Corona	C. Fröhlich, M.C.E. Huber, S.K. Solanki, R. von Steiger	1998	6.9	44.9	1'663
6	Magnetospheric Plasma Sources and Losses	B. Hultqvist, M. Øieroset, G. Paschmann, R. Treumann	1998	2.7	11.1	100
7	Corotating Interaction Regions	A. Balogh, J.T. Gosling, J.R. Jokipii, R. Kallenbach, H. Kunow	2000	2.0	18	252
8	Composition and Origin of Cometary Materials	K. Altwegg, P. Ehrenfreund, J. Geiss, W.F. Huebner	2000	1.6	18.1	598
9	From Dust to Terrestrial Planets	W. Benz, R. Kallenbach, G. Lugmair	2000	3.5	15.8	380
10	Cosmic Rays and Earth	J. W. Bieber, E. Eroshenko, P. Evenson, E.O. Flückiger, R. Kallenbach	2000	2.8	21.6	345
11	Solar Variability and Climate	E. Friis-Christensen, C. Fröhlich, J.D. Haigh, M. Schlüssler, R. von Steiger	2000	4.9	17.2	327
12	Chronology and Evolution of Mars	R. Kallenbach, J. Geiss, W.K. Hartmann	2001	8.4	50.8	812

13	The Astrophysics of Galactic Cosmic Rays	R. Diehl, E. Parizot, R. Kallenbach, R. von Steiger	2002	2.4	12.0	335
14	Matter in the Universe	Ph. Jetzer, K. Pretzl, R. von Steiger	2002	1.0	2.7	64
15	Auroral Plasma Physics	G. Paschmann, S. Haaland, R. Treumann	2003	0	1	1
16	Solar System History from Isotopic Signatures of Volatile Elements	R. Kallenbach, T. Encrenaz, J. Geiss, K. Mauersberger, T. Owen, F. Robert	2003	2.6	9.4	206
17	Earth Gravity Field from Space - from Sensors to Earth Sciences	G. Beutler, M.R. Drinkwater, R. Rummel, R. von Steiger	2003	0.5	3.8	137
18	Mars' Magnetism, and Its Interaction with the Solar Wind	D. Winterhalter, M. Acuña, A. Zakharov	2004	2.0	13.5	108
19	The Outer Planets and their Moons	T. Encrenaz, R. Kallenbach, T. Owen, C. Sotin	2005		3.7	84
20	Outer Magnetospheric Boundaries: Cluster Results	G. Paschmann, S.J. Schwartz, C.P. Escoubet, S. Haaland	2005		8	80
21	Coronal Mass Ejections	H. Kunow, N.U. Crooker, J.A. Linker, R. Schwenn, R. von Steiger	2007		6.8	123
22	Solar Dynamics and its Effects on the Heliosphere and Earth	D. Baker, B. Klecker, S. Schwartz, R. Schwenn, R. von Steiger	2007		2.8	71
23	Solar Variability and Planetary Climates	Y. Calisesi, R.M. Bonnet, L. Gray, J. Langen, M Lockwood	2007		2.6	93
24	Geology and Habitability of Terrestrial Planets	K.E. Fishbaugh, P. Lognonné, F. Raulin, O. Korablev, D. des Marais	2007		1.8	18
25	Strategies of Life Detection	O. Botta, J. Bada, J. Gómez Elvira, E. Javaux, F. Selsis, R. Summons	2008		0.2	6
26	Mercury	A. Balogh, L. Ksanfomality, R. von Steiger	2007		1.2	18
27	The Composition of Matter	R. von Steiger, G. Gloeckler, G.M. Mason	2007		2.1	102

28	Origin and Early Evolution of Comet Nuclei	H. Balsiger, K. Altwegg, W. Huebner, T. Owen, R. Schulz	2008	0.4	7
29	Comparative Aeronomy	A.F. Nagy, A. Balogh, Th. E. Cravens, M. Mendillo, I. Müller-Wodarg	2009	0.5	5
30	Planetary Atmospheric Electricity	F. Leblanc, K. Aplin, Y. Yair, G. Harrison, J.P. Lebreton, M. Blanc	2008	2.1	66
31	From the Outer Heliosphere to the Local Bubble	J.L. Linsky, V.V. Izmodenov, E. Möbius, R. von Steiger	2009		
32	The Origin and Dynamics of Solar Magnetism	M.J. Thompson, A. Balogh, J.L. Culhane, Å. Nordlund, S.K. Solanki, J.-P. Zahn	2009		

Note: Vol. 15 is a fully integrated book, making it difficult both to cite parts thereof and to track such citations.

Annex 5: ISSI Scientific Report Series (SR): Published Volumes

(Also available from: The Bookshop, ESA Publications Division)

#	Title	Editors	Year
1	Analysis Methods for Multi-Spacecraft Data	G. Paschmann, P.W. Daly	1998
2	Radiometric Calibration of SOHO	A. Pauluhn, M.C.E. Huber, R. von Steiger	2002
3	The Solar System and Beyond - Ten Years of ISSI	J. Geiss, B. Hultqvist	2005
4	Head and Gas Diffusion in Comet Nuclei	W.F. Huebner, J. Benkhoff, M-T. Capria, A. Coradini, C. De Sanctis, R. Orosei, D. Prialnik	2006
5	The Physics of Heliospheric Boundaries	V.V. Izmodenov, R. Kallenbach	2006
6	Planetary Systems and Planets in Systems	S. Udry, W. Benz, R. von Steiger	2006
7	Calibration of Particle Instruments in Space Physics	M. Wüest, D. Evans, R. von Steiger	2007
8	Multi-Spacecraft Analysis Methods Revisited	G. Paschmann, P.W. Daly	2008

Annex 6: ISSI guests and Visiting Scientists (2006-2009)

- Frank Arnold, Max Planck Institute for Nuclear Physics, Germany
- Isabelle Baraffe, Ecole Normale Supérieure Lyon, France
- Lennart Bengtsson, Environmental Systems Science Center, UK
- Johann Bleeker, SRON Netherlands Institute for Space Research, the Netherlands
- Gilles Chabrier, Ecole Normale Supérieure Lyon, France
- Len Culhane, Mullard Space Science Laboratory, UK
- Geza Erdős, KFKI Research Institute for Particle and Nuclear Physics, Hungary
- Len Fisk, University of Michigan, USA
- Robert Forsyth, Imperial College London, UK
- George Gloeckler, University of Maryland, USA
- Walter Huebner, Southwest Research Institute, USA
- Hannu Koskinen, University of Helsinki, Finland
- Leonid Ksanfomality, Russian Academy of Sciences, Russia
- Ingrid Mann, Kobe University, Japan
- Ken McCracken, University of Maryland, USA
- Olivier Mousis, University of Bern, Switzerland
- Götz Paschmann, Max Planck Institute for Extraterrestrial Physics, Germany
- Karoly Szegő, KFKI Research Institute for Particle and Nuclear Physics, Hungary
- Igor Tolstikhin, Kola Scientific Center of the Russian Academy of Sciences, Russia
- Rudolf Treumann, Ludwig-Maximilians-University, Germany
- Hunter Waite, Southwest Research Institute, USA
- Lev Zelenyi, Russian Academy of Sciences, Russia
- Thomas Zurbuchen, University of Michigan, USA