



ANNUAL REPORT 2015

CZECH SPACE OFFICE, O.P.S.

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1. Czech Space Office mission

The Czech Space Office (CSO) is a nonprofit organization that since its inception in 2003, strives to support development in the Czech Republic. The main objective of the CSO is creating and maintaining the space information infrastructure fostering a representative and efficient participation of Czech research, development and industrial organizations in the international space projects. To reach that goal the Czech Space Office gains related expert knowledge needed for successful results of space establishment in the Czech Republic and promotes Czech space related capabilities on international space fora.

CSO staff is involved in the activities in four programme committees and councils of the European Space Agency (ESA). The Office is also represented in the Czech PRODEX committee recommending the development of Czech science experiments for ESA missions. CSO is also a member of the International Astronautical Federation (IAF) and is an associate member of the international organization Eurisy.

1.1. Strategy and fields of activity

The strategy of the CSO activities reflects the specifics of the Czech Republic implying necessity of the international cooperation for making any national space project possible. Hereafter an important part of the CSO activities is to support intensive and broad participation of the Czech Republic in the international space programmes by promoting peaceful use of outer space and the benefits derived from it.

Czech Space Office operation is based on the strategic goals broken down into specific activities that can be divided into several areas:

- analysis and studies about Czech participation in space programmes and projects,
- consultancy and seminars about space project opportunities and project administration,
- promotion of Czech space organizations at major international events,
- support of education and student space projects.

1.2. Staff and governance

The Czech Space Office has a status of independent non-profit organization and it is managed according to the Czech respective law. In compliance with the law, the Managing Board and Supervisory Board are the key ruling as well as advising bodies of the CSO. They meet regularly throughout the year and provide management guidance to the Director on the Czech Space Office's performance, operations, budget control as well as on current priorities and future opportunities in which the CSO should participate, both at a national and international

level. The management and control structure has been built around senior experts from space research, administration and public sector.

The CSO workforce comprised total of 10 people during 2015 professionally covering main topic fields of space research and development, documents publication and general internal administration, travel and financial services. Financial resources used by CSO in 2015 stemmed from grant projects awarded by the Ministry of Education, Youth and Sports, EU Structural Funds, EU Horizon 2020 and US Embassy in Czech Republic.

2. Sustainable engagement in space

The Czech Space Office provides support to Czech academic and private research teams to be successful in their competition on an international level. It assists and advises for activities with strong involvement in ESA and other bilateral science missions and projects. Following cooperation agreement with XCOR Aerospace Inc., the CSO also provides detailed information about flight services on Lynx rocket plane (explanations of technical requirements of packaging, environment conditions, safety, operational flight profile and interface) for both automated experiments running without man's involvement, and those experiments requiring human operator.

In strategic outlook the Czech Space Office is repeatedly proposing to respective ministries to create a modest space technology programme which might bring together academia and industry in developing the next generation technologies required for future missions.

2.1. Consultancy service on new opportunities in space

Due to the ever growing complexity of space programmes, consulting and advisory services supporting the successful use of new opportunities for scientific research and technology development are even more needed. The Czech Space Office receives requests for information from government, private and academia sector. Content is wide-ranging and covers issues from space policy to requests for careers advice.

Specifically, CSO has provided consultancy to academic, industry and public sector organizations to advance their space related technologies to higher technology readiness levels. This improves industry's ability to accelerate innovation, expand sales in the commercial space market and reinforce the Czech position as a stronger player in future international space programmes. In 2015 the CSO performed 66 individual consultations of which 26 were with research organizations, 20 with government bodies and 20 with industry.

Consultancy and advising discussions with research institutions included mainly explanatory description of procedures and requirements for running a space project, helping to determine suitable foreign partners or discussing specific demands of ESA projects. Besides that CSO informed interested organizations about updated opportunities in ESA programmes (mainly

TRP, GSTP-6, FLPP-3, SSA-2, MREP-2, GSP, MetOp-SG, ELIPS, PRODEX, EOEP, CSC, EGEP and ARTES) and EU Horizon 2020 space calls.

Ministry of Education, Youth and Sports, Ministry of Industry and Trade, and Office of the Government were among governmental bodies asking CSO information or view on specific issues of Czech participation in international space programmes, namely European Space Agency. CSO also started its preparatory activities for ESA Ministerial Council taking place in December 2016. CSO also provided expert advice to CzechInvest on the establishment and operation of ESA Business Incubation Centre (ESA BIC) in the Czech Republic. Finally, CSO provided the Czech Embassy in Moscow about the status of Czech space and of capacities and plans on scientific cooperation with the Russian Federation.

In 2015, CSO also participated in domestic and international professional conferences and seminars. The themes were mainly situation in Czech space and presentation of Czech participation in the space programs.

Space Exploration

In 2015, the most important event for the Czech Republic was the release of call for proposal of landing platform for a robotic mission ExoMars 2018. The call was announced by ESA in cooperation with Russia and it included both the possibility of involvement to the existing Russian payload and the possibility of designing a separate European instrument. Czech scientific institutions had responded to the call and one of their proposals was chosen. CSO kept informed the selected department about the status of the ExoMars 2018 and the work timetable. ESA also announced the results of the call for M4 mission, that had CSO consulted with several institutions past year. One of the three selected is the THOR mission in which two Czech researcher institutions will participate. CSO also informed about the upcoming call for the M5 mission and the likely schedule. CSO also continued in providing consulting services to one research department on the study phase of the potential scientific and technological ESA mission for research of small solar system bodies. Consultations went on with the industry on its possible involvement at the MREP-2 program.

Microgravity research

In 2015, the main goal of the provided consulting services was the involvement in ongoing, upcoming and planned experiments, mainly those for International Space Station (ISS). Part of the consultations was devoted to suborbital flights and stratospheric balloons. CSO discussed the plans of the Czech workplaces and recommended next steps that included integration into the existing project team or waiting for a suitable call in the coming years. In 2015, CSO actively participated in the preparation of biological and physiological experiments on the ISS and preparation of ground equipment for scientific research in microgravity and hypergravity conditions. Also the cooperation discussion with the Russian Academy of Sciences has started including the preparation of two bilateral calls for the year 2016.

Earth and surroundings

CSO informed a wide range of Czech scientific and research institutions on upcoming project opportunities in the ESA Earth Observation Envelope Programme (EOEP). Among them appeared the calls of new satellite Biomass, small contracts intended for gaining more experience with involvement in the ESA, three new activities in the Value Adding element (VAE) for global financial institutions in the areas of water, agriculture, and rural and urban development, and the possibility to prepare products at the L2 from Sentinel. CSO's important activity was the submission of information on new technologies that would find application in future satellite projects. In this context, it was mainly about getting familiar with the content of a publication entitled Compendium of EO Mission Concepts, which summarizes the concepts of missions that are under consideration for a future Earth Explorer 9 mission. The second document of major importance was the newly introduced concept of Scientific Readiness Level (SRL). CSO also disseminated the information about upcoming conferences and seminars thematically close to the activities carried out in the Czech Republic, namely the conference Mapping Urban Areas from Space (MUAS) 2015, Atmospheric Science Conference – Sentinel 5P in June 2015 and Living Planet Symposium, organized by ESA in 2016 in Prague.

Telecommunications systems

In 2015, the CSO informed about the program activities of Advanced Research in Telecommunications Systems (ARTES) and European GNSS Evolution Programme (EGEP). The consultations concerned general information on these programs and specific opportunities for possible involvement.

Space technology development

CSO in 2015 specifically informed and consulted number of project opportunities mainly in ESA General Support Technology Programme (GSTP) and the Basic Research Technology Programme (TRP). CSO did so by sending out work plans and their updates with identification of specific activities for each addressed workplace. CSO informed more than forty organizations and companies. Part of this communication resulted in further dialogue about specific conditions and ways of involvement in identified activities. The content of consultations was related to general project opportunities as well as specific opportunities for individual workplaces, for example in the development of optical components, chemical probes or area of cryogenics.

Launchers

Despite the fact that the area of launchers in the Czech Republic may seem difficult to reach, the Czech workplaces successfully participated in the ESA Future Launchers Preparatory Programme (FLPP). The amount of 1.00 million Euro of a Czech contribution to third period was fully utilized and the Czech Republic increased it by a further € 1.69 million in November 2015. However, the entire amount was allocated to specific projects and the involvement in

new projects is therefore very limited. CSO tried to point out the capacity of the Czech space industry in the development of technologies for launchers and increase the contribution in this area for the further development of these capacities.

Space Situational Awareness

CSO kept broadly informed entities in the Czech Republic of all relevant activities under the ESA Space Situational Awareness (SSA) and assisted in their involvement in this program. Due to the fact the Czech Republic participate in this optional program since 2013, it was necessary to continue to spread awareness of the benefits of participating in this program. Many Czech organizations, however, were successfully involved, in the fields of space weather and near-Earth asteroids, as well as tracking space debris. CSO participated in several ESA workshops on the new proposed architecture of distributed SSA systems. Thanks to the participation in the program, the CSO got involved in the consultation and approval of the preliminary proposals and monitoring of the progress of activities, development of international cooperation in space monitoring and defining SSA long-term plans.

2.2. Consultancy service on project management

Since 2014, the CSO focuses on project management, specific area of astronautics that is indispensable in addition to technical knowledge and skills for the successful solution of space projects. Advisory activities were supported by publishing of articles on this issue in the Czechspace magazine and CSO web, organizing of seminars and providing consultations. CSO, as a member of the IAF International Project/Programme Management Committee (IPMC) nominated three of Czech project managers for the course of international project management, organized by NASA's Kennedy Space Center in Florida in February and July 2015. The CSO also presented its activities in project management in its interactive presentation of at the 66th international Astronautical Congress.

2.3. Workshops and seminars

In 2015, CSO carried out total of 5 events attended by over 150 experts from different organizations.

CSO organized an event called the International interdisciplinary workshop to establish cooperation in space research on 31 January 2015. The workshop was aimed at introduction of participants and workplaces, brainstorming and finding opportunities for joint research and development. Also, possibilities of cooperation in the stratosphere and suborbital space flights were discussed. Besides technical problems the discussion was led about the necessary financial resources to support of Czech-Slovak and broader international cooperation. The attention was paid to cooperation with the Russian Federation's top centers of biological and physiological research in space flight conditions. The workshop was attended by 11 Czech and Slovak researchers representing 5 organizations.

A seminar entitled Support of the development of the ICT industry in the space sector was organized by CSO on 26 March 2015 as part of AMPER conference. The event was carried out in collaboration with the Development and Implementation Laboratories of the Faculty of Electrical Engineering. The main topics included opportunities in the space programs of ESA and the EU in the field of information and communication technologies. Individual elements of the ARTES program were paid a special attention as well as GNSS applications under the EU H2020 Space. The audience consisted of 7 industry and academic representatives with the basic knowledge and practical experience in space projects.

CSO also organized a seminar on using its SPACE 50 database on 25 April 2015. The current status of database preparation, its possible applications and web interface were presented in the first public presentation to 65 people.

With the support of partners from the Faculty of Electrical Engineering, Space Generation Advisory Council (SGAC) and Czech companies Gisat and Serenum, the Czech Space Office organized Czech Space Day conference and Czech Space Competition for young people interested in space. The event took place on 3 July 2015. The first part of the conference consisted of presentations of the eight competing articles of students in age from 18 to 26 years. The winner won a fully covered trip to the 66th International Astronautical Congress and the 14th Congress of the Space Generation in Jerusalem. The award also included the winner's presentation of his work in both events. In the second part of the conference there were presented specific opportunities for students and young professionals in the space within the Czech scientific and industrial organizations. At the end, the students summarized their experiences abroad. The event was attended by 68 people.

At the end of 2015, the Czech Space Office organized a couple of seminars on project management. The seminars informed about project management and opportunities for involvement in space, program rules, ECSS standards, ESA EMITS system and general information on project proposals and administration. Both seminars were attended by 12 people.

2.4. Database

In 2015, CSO continued forming two separate databases, which will play role of a unique source of information of which will benefit professionals and the public.

The first of these is the Great encyclopedia of artificial space objects SPACE 50 that contains records of all man-made space objects with a payload. It is operated as an online database for professionals and public providing basic information about those artificial space objects describing their technical parameters and status. The database is accessible on the website www.space50.org.

The second database is planned to provide basic overview on capacities of Czech institutions in the space sector. It will contain information on individual research and development organizations, industrial companies and universities, their professional skills and projects they have already been involved in. The database website will be unique place allowing straightforward access to kind of information requested and needed for anyone looking for partners in the Czech Republic. The quality and scope of the data will be guaranteed by each organization as it will be responsible for keeping data updated. In 2015, complex information of Czech institutions was collected. It was obtained data of almost 150 workplaces, 90 of which had already been implemented in the database.

3. Public relations

Space development, related technology, knowledge and space based services are touching all facets of human life in the country. Task of great importance in the Czech Space Office work plan is creating awareness about the space programme benefits among the general public, especially young people. Great effort has been given to publications, educational activities like lectures, interactive sessions with students and media campaigns on important events. The CSO staff continued working to keep people up to date with the latest news and developments. Cooperation with all kinds of media has been very productive and fruitful resulting in more than 406 direct mentioning and citation in 2015.

3.1. Press conference and press releases

At the opening of the symposium Humans in Space (HIS) 2015 which was hosted by the Czech Space Office in Prague from 29 June to 3 July, a press conference was held for Czech and foreign journalists. The HIS 2015 mission and importance to international cooperation and deepening of both the existing and new relationships between scientists from different parts of the world was presented. The invitation was accepted by Gerzer Rupert, director of the Institute of Aviation Medicine of the German Aerospace Center (Deutsche Zentrum für Luft- und Raumfahrt, DLR), Reinhold Ewald, a former DLR and ESA astronaut and Iva Solcova, researcher at the Institute of Psychology of the Academy of Sciences. The press conference was attended by 12 journalists.

26 November 2015, a regular Autumn meeting with journalists was organized by CSO. The main theme was new Czech instruments intended to fly in European space probes Solar Orbiter, ExoMars and JUICE. There were also presented the devices prepared for Russian Luna probe, satellites Resonance and Strannik and French satellite TARANIS. The invitation to speech was accepted by Zdenek Nemeczek and Lubomir Prech of the Faculty of Mathematics and Physics at Charles University in Prague and Ondrej Santolik, Jan Soucek and Ivana Kolmasová of the Academy of Sciences of the Czech Republic. The press conference was attended by 15 journalists.

In 2015, CSO also published 7 press releases related to important events with CSO participation.

3.2. Web information

Website is the main channel, that the Czech Space Office uses for distribution of wide range of information including opportunities for involvement in ESA and EU programmes, results of completed projects with Czech participation, information about seminars and training opportunities for students, as well as on the latest developments in the Czech space science and industry.

The website has been operated in the Czech and English languages. English version contains articles about the Czech activities and achievements, information adopted from otherwise accessible foreign sources is given only in Czech.

The reader can find the requested information either by area of interest (e.g. general technology, microgravity research, Earth observation, education) or by the type of content (e.g. news, programmes, publications, opportunities). Publications such as the annual report, the Czechspace magazine and educational articles are also available for free download. In 2015, 24,557 visitors saw the CSO website in 62,906 separate page views.

Social media is another important mean of direct CSO's communication with wide audience. People can follow us on digital channels such as Twitter, Google Plus and Facebook. The Facebook profile has been filled with news especially for the purpose of addressing a community of young people who often use social networks. In 2015, the number of Facebook followers has increased to 1152. The total number of users who have seen any content associated with a CSO Facebook page was 51,402 representing an average of 141 unique visitors per day. CSO twitter news are regularly read by 70 followers, Google Plus account has 18 fans.

3.3. Electronic newsletter

Electronic newsletter includes a brief annotation about the last month news published on the CSO website with a link to the full text. Newsletter has been regularly distributed free of charge every month.

3.4. Printed publications

Along with the electronic publications, CSO has prepared and distributed significant number of documents in the paper form, as well. During 2015 following documents were published in the Czech language:

- 2 issues of the Czechspace magazine (number 11 and 12),
- 7 information sheets on projects (project infosheets),

- 2 newsletters Centre of Student Activities CSO,

One of the documents was distributed in English language:

- Brochure Czech Space Activities.

Czechspace magazine

Two issues of the bi-yearly, Czechspace magazine were released at the end of the first and the second semester, respectively.

The eleventh issue of the magazine contained the information on involvement in European launchers projects of companies Synpo, Toseda and Explosia, an interview with Radek Peresty who stands behind the Czech MAC microaccelerometers and enterprise 5M that and its technological processes of composite materials, sandwich panels and adhesives. Among other topics there are testing of the super-capacitors, evaluation of the project Guide to the world of technology for kindergarten teachers and the 15th Kosmos-News Party conference that brings together once a year more than 100 amateurs and professional experts interested in space.

The twelfth issue was devoted mainly to Czech Space Research Centre (CSRC), which produces electronics designed for use in space, the interview with Ladislav Pina, a founder of Rigaku Innovative Technologies Europe (RITE) and Karolina Rybarova, a Czech lawyer currently working at the spaceport in Kourou, French Guiana. Furthermore, the magazine contains a call for participation in European competition Odysseus co-organized by the Czech Space Office and evaluation of Humans in Space 2015 symposium held in Prague's Diplomat Hotel.

Each issue was printed in 700 copies and distributed free of charge among 310 interested users - experts, politicians and enthusiasts. The magazine copies have also been handed out to participants at seminars, conferences and consultancy meetings. Moreover, an electronic version of the complete issue has been downloaded from the CSO web page more than 500 times.

Project Factsheets

In 2015, the Czech Space Office further extended a package of standard printed sheets describing completed space projects with the Czech participation. Named as a factsheet, it includes simultaneously Czech and English description of a Czech partner in selected significant space projects. Along with project task description, every information sheet contains main results achieved by the Czech organization involved together with its professional profile. Altogether 7 new sheets were printed during the year and added to previous projects in the file.

Information brochure Czech Space Activities

The brochure gives general and introductory overview about past and present of the space activities in the Czech Republic and summarizes the major Czech space projects and capacities relevant to the recent years. A slim publication presents main Czech achievements from space science and space awareness to microgravity research, launchers, space technology, space applications to education and outreach. In 2015, the brochure was updated and released in an edition of 200 copies. Czech Space Activities brochure has been distributed to international partners and among space community, especially on the occasion of the 66th International Astronautical Congress in Jerusalem.

Student Newsletter

The newsletter gives basic information on educational actions and events organised or supported by the CSO. Its target readers are students in primary and secondary schools. The CSO's Centre of Student Activities has published two issues in 2015 (spring and autumn). Along with a list of student programmes and activities available in next period of time, the newsletter brings stories about Czech students and teams taking part in international projects. Newsletters were added in prepared information packages for teachers and distributed at outreach events with CSO participation.

4. Education and outreach

Space acts as a beacon to attract a new generation of engineers, scientists and entrepreneurs into activities that are vital in generating the economic activity needed to drive sustainable growth of society. CSO continuously strives to ignite the spark of awareness and appreciation in young minds for Earth observation technology, satellite technology and space science and space operations. There are two directions in which CSO is working in this field: the one is to educate for space – addressing the need for skilled graduates and technicians in the space sector. The other is space for education – using the exciting context of space to inspire an interest in science, technology, engineering and mathematics.

In 2015, CSO co-organized the Guide to the world of technology project, within which it presented the universe as an interesting topic for polytechnic education of kindergarten children. The project was attended by more than 90 kindergarten teachers that attended series of workshops and a two-day excursion to the popularization scientific center iQLandia.

In the past year, 11 meetings about flying into space were arranged with children from participating kindergartens. The events were attended by over 360 of them.

4.1. School supporting

CSO works together with school teachers since its formation performing space outreach initiatives in every region of the country. Teachers and students of primary and high schools

from the list have been regularly informed about education activities available in ESA, NASA, CSO and other organisations. More than 900 subscribers received information email of the CSO Centre of Student Activities every month with an updated overview of student competitions, courses for teachers, student internships and sponsored conferences.

4.2. Mars expedition

For nine years the Czech Space Office has been co-organiser of the student knowledge competition the Expedition Mars. The competition run every year and is designated for teams of young people of age 13 to 18. After several rounds of elimination system the winning team gains a practical training at the Centre for young astronauts in the Belgian base in Transinne. Under auspices of the first Czechoslovak astronaut Vladimir Remek and the first Slovak astronaut Ivan Bella, ten children took part in space flight simulation during the final event.

4.3. Mission X

Mission X: Train Like an Astronaut is an international educational programme designed by NASA, supported by ESA and led in the Czech Republic by the Czech Space Office. It aims to inspire the interest in science, nutrition and fitness in school students aged 8 to 12 years by using astronaut training as a context. Past year was the fifth one when CSO managed the programme among 12 school teams equating to a total of 233 pupils nationwide. Children were tasked to undertake a variety of physical exercises and learning lessons similar to those in astronauts' training. The programme also grew internationally with a total of 30 countries now involved, providing more opportunities for Czech schools to network globally.

4.4. Odysseus

Since 2015, the Czech Space Office have co-organized European educational competition Odysseus financed by the EU program Horizon 2020. The aim of the contest is to inspire young people over Europe to participate in space exploration and to offer a chance to show expertise in a wide range of issues connected with the universe, from satellites and space probes to astrobiology and interplanetary travel. The Czech Space Office organized the competition for one of the ten European regions, which brought together Czech Republic, Slovakia and Romania. The competition started on 1 September 2015.

4.5. Czech Space Network

In July 2015, CSO founded Czech Space Network for active students and young professionals interested in space. By the end of 2015, the network had 70 members. This group allows its members to communicate with each other, share information about opportunities, exchanging experiences and ideas, creating custom activities, collaborate on projects and manage regular meetings. The group also helps connect its members with representatives of Czech industry and research institutes as well as foreign and international community.

4.6. Outreach

The Czech Space Office has been the National Coordinator of World Space Week (WSW) for twelve years. This UN event is held every year from 4 October to 10 October. In order to create interest and awareness on space research, astronomy and related physics, 12 dedicated WSW events took place over the Czech Republic attended by more than 2,500 people. A national report 2015 was sent to the WSW international organizers.

In parallel to international actions the Czech Space Office was involved in several of national events. Beside others, CSO was co-organizer of the Central European meeting of space enthusiasts Kosmos-News Party 2015.

Thanks to the US Embassy in the Czech Republic support, a doctor and former NASA astronaut, Scott E. Parazynski accepted invitation of the Czech Space Office to hold two lectures about his personal experience with space in Prague. He visited the orbit five times, stepped into outer space seven times and spent 57 days in space. Visitors could though appreciate amount of unique photos and videos taken during these trips. With the support of CSO, Scot E. Parazynski also took the opportunity to speak in the Czech show called Hyde Park Civilization broadcasted on 28 November 2015 on the Czech television channel.

CSO organized a total of 68 educational lectures and discussions for elementary and high schools and universities as well as for young scientists, technicians and the public. In total, the events were attended by 2,979 visitors.

5. International activities

The Czech Space Office makes its best effort to maintain high-level knowledge about updated opportunities for international collaboration in space programmes. Building on that knowledge, CSO can successfully fulfil its role of supporting, advising and intermediary body on international cooperation with required associated information exchange between domestic and international space environment.

During the year 2015, CSO participated in various multinational projects and forums, including International Astronautical Congress, and took part in work of several bodies of the European Space Agency.

5.1. European meetings

Members of CSO staff are national delegates in five ESA committees and programme boards.

Two of them are the ESA Programme Board for Human Spaceflight, Microgravity and Exploration (PB-HME) and its scientific and technical advisory board (PB-HME-EUB). The meetings were mainly devoted to the development of experiments on the ISS as well as ground equipment for ELIPS-4. The priorities of the use of the ISS were approved and a

program to extend its operation until the 2024 was prepared. In the field of robotic exploration of the solar system, the ExoMars mission has been continuously monitored and the future exploration of Mars has been prepared in the MREP-2 program. Scientific instruments for the ExoMars 2018 mission were chosen, including one from the Czech Republic. Also the cooperation on the forthcoming Russian Luna probes was started. CSO also participated in three workshops on the extension of ISS operation until 2024 and manned flights beyond low Earth orbit. CSO has also attended two scientific symposia focused on technologies for robotic and manned exploration of the solar system and plans for the Moon exploration.

A CSO representative in the Technical Advisory Board of the ESA Programme Board for Earth Observation (EO-PB/ DOSTAG) followed its work primarily focused on the implementation of the EOEP-4 program, the development and construction of Earth Explorer, Sentinel and Meteosat Third Generation satellites and MetOp Second Generation. During the meetings there was discussed distribution, processing and archiving of the obtained satellite data and the development of applications built on these data. There were also presented detailed reports on various satellite missions and other smaller projects, particularly with regard to technical problems and their solutions.

A delegate from CSO has been also present at the ESA Board of Space Situational Awareness (SSA). The CSO thus participated in approving the preliminary proposals of activities, monitoring the progress of running activities, development of international cooperation and determination of ESA long-term plans. An important activity of 2015 was the search for flight opportunities for scientific instruments monitoring space weather.

5.2. International organizations

CSO has been active member of international organizations such as the International Astronautical Federation (IAF), the International Academy of Astronautics (IAA) and took part in programmes of the UN Office for Outer Space Affairs (COPUOS). CSO has been also only representative in European Low Gravity Research Association (ELGRA).

Membership of CSO in the International Astronautical Federation has been well established for many years. In recognition of its expertise and experience in the field, the Czech Space Office is represented on several IAF committees, namely the Earth Observation Technical Committee, International Project/Programme Management Committee (IPMC), Workforce Development – Young Professionals Programme Committee (WD-YPP), Space Education and Outreach Committee (SEOC) and Knowledge Management Technical Committee (KMTC). The Director of the Czech Space Office has been re-elected IAF vice-president by the General Assembly of the Federation in October 2014. In his capacity of the vice-president for finance he is a member of the IAF Bureau and chairs the Financial Committee of the Federation. The Bureau organised two meetings, in March on the occasion of the meeting of the program

committee of the forthcoming International Astronautical Congress and in October during the week of the Congress in Jerusalem. At the IAC Congress in Jerusalem, the director of CSO also attended the meeting of former IAC organizers with new IAC candidates. At the invitation of NASA headquarters, the director of the CSO also attended the working session of representatives of space agencies present at the Congress. Its purpose was to start a long-term discussion on cooperation in human flights to the Moon and Mars.

CSO, through its representative, actively participated in the work of IPMC, KMTC, WD-YPP and SEOc committees. Information about related activities in the Czech Republic were given at the March and October meetings of these committees. Specific contributions to the committee's work included performing the rapporteur function for the technical section focusing on education and participation in the organizational team for a virtual technical section at the International Astronautical Congress in Jerusalem. Membership in WD-YPP and SEOc committees has also allowed the dissemination of information on various competitions, internships and other opportunities to Czech students and young professionals.

In 2015, CSO managed to organize the 20th IAA Humans in Space Symposium (HIS) that took place from 29 June to 3 July in Prague. The Symposium was attended by 214 visitors from 24 countries which introduced 141 presentations and 33 posters of their expert work. Among the participants, there were also 11 of them from the Czech Republic and 3 astronauts – Dumitru Prunario, Reinhold Ewald a Leroy Chiao. The Humans in Space Symposium is organized once in two years and in 2015 CSO was responsible for the Symposium logistics, establishment of the Scientific Committee and the range of scientific topics presented at the conference. The summary report of the Symposium was presented to the joint meeting of the expert bodies of IAA and IAF during 66th International Astronautical Congress in Jerusalem. The report was adopted and the organizers expressed thanks for the excellent organization.

At the turn of September and October 2015, the CSO participated in the symposium of the European Low Gravity Research Association (ELGRA) in Corfu focused on the issue of research in conditions of reduced gravity, microgravity and hypergravity. The Czech Space Office also presented a joint study of CSO, Faculty of Mechanical Engineering of the Czech Technical University, Faculty of Mathematics and Physics of the Charles University and Kosmo Club on the topic of low-cost drop tower for educational and scientific purposes. Thanks to the presentation of the study, a cooperation with the Spanish team working with the proposal of use of quadcopter was successfully initiated.

For many years, CSO regularly participates with its own booth at the exhibition of the International Astronautical Congress. In IAC 2015 in Jerusalem, the CSO stand presented CSO's activities including cooperation with XCOR Aerospace, together with results of some of Czech institutions and companies. Nine of Czech organizations used the CSO offer and presented their instruments and scientific results at the booth. The main interest of visitors was

concentrated on possibilities of cooperation in European programmes, the experiences and capabilities of the Czech institutions and on examples of the Czech space projects. CSO has managed to establish dozens of new contacts, to gather new possibilities for cooperation in student satellites and information about potential scientific instruments for satellites. During IAC, CSO also led an interesting discussion about the possibilities of presentation of Czech organizations at the new web portal, which is used to promote space products and services in Chinese market. Another discussion led by CSO was focused on the possible location of Czech scientific instruments aboard future Chinese satellites.

During the 2015, one of CSO representatives held the function of the Czech national point of contact of the Space Generation Advisory Council (SGAC). The established cooperation opens additional possibilities to support Czech students and young professionals by distribution of the information on international projects, competitions and other activities.