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**LOCAL AUTHORITIES AND COMMUNICATORS ENGAGED IN SCIENCE: PLACES\* IMPACT ASSESSMENT CASE STUDY OF PRAGUE**

**Abstract:** *This study focuses on research questions related to regional dimension of science communication, its impacts and suitable tools. Document analysis and a questionnaire distributed among selected experts were used for elaboration of the study. Results suggest that the regional dimension of science communication policy and initiatives (SCIP) is relevant in Prague. However, the attention given to this topic by national and regional authorities is unsatisfactory, resulting in the lack of activity co-ordination between the respective stakeholders. Impacts of SCIP consist of encouraging young people's interest in science, increasing awareness of general public in science-related issues and explaining the role of science in society and the problems it is facing as a sector. To maximize the effects of science communication, national and regional authorities should play an integrating role. Given the concentration of SCIP actors, the City of Prague should aspire to develop its science communication policy.*

**Keywords:** *science communication policy and initiatives; regional dimension of science communication; city of scientific culture*

**ADOLF FILÁČEK**

Centre for Science, Technology, and Society Studies / FÚ Akademie věd ČR, v. v. i.  
Institute of Philosophy, Academy of Sciences of the Czech Republic  
Jilská 1, 110 00 Praha 1, Czech Republic  
e-mail: filacek@kav.cas.cz

**JAKUB PECHLÁT**

Economic Analysis Unit / City Development Authority Prague  
Vyšehradská 57, 128 00 Praha 2, Czech Republic  
e-mail: pechlat@urm.mepnet.cz

**Komunální orgány a komunikátoři ve vědě: případová studie Prahy ve vyhodnocení dopadů PLACES\***

**Abstrakt:** *Tato studie se zaměřuje na výzkumné otázky vztahující se k regionálnímu rozměru komunikace vědy v Praze, jejím dopadům a vhodným nástrojům. Pro vypracování studie byly použity analýza dokumentů a dotazník distribuovaný vybraným expertům. Výsledky naznačují, že regionální rozměr komunikační politiky a iniciativ pro vědu (SCIP) je v Praze relevantní. Avšak pozornost věnovaná této otázce národními a regionálními úřady je nedostatečná a vede k nedostatečné koordinaci mezi zainteresovanými aktéry. Dopady SCIP spočívají v povzbuzování zájmu mladých lidí o vědu, zvyšování obeznamovanosti široké veřejnosti s otázkami vztahujícími se ke vědě a ve vysvětlování role vědy ve společnosti a problémů, jimž jako sektor čelí. Aby byly dopady komunikace vědy maximalizovány, národní a regionální oficiální místa by měla sehrát integrační roli. Vzhledem ke koncentraci aktérů SCIP by město Praha mělo aspirovat na rozvinutí vlastní politiky komunikace vědy.*

**Klíčová slova:** *komunikace vědy; komunikační politika a iniciativy; regionální rozměr komunikace vědy; město vědecké kultury*

\* PLACES Project „Platform of Local Authorities and Communicators Engaged in Science” is the four-year European project (2011-2014), financed from FP7, establishing and developing the concept of the European City of Scientific Culture.

## 1. Introduction

Regional aspects of science communication represent a potential asset and as such are quite suitable topic for further examination with respect to future social and economic development in Prague. Science Communication Initiatives and Policies (SCIP) have a significant influence on relationship of general public to science and research and on appreciation and dissemination of new technologies. This case study has therefore set several main research questions on which the examination will be based.

### *Research focus and questions:*

Does science communication in Prague have a discernible regional dimension?

What are the impacts of SCIP in the 4 pre-defined areas?

What are suitable tools for SCIP with respect to competencies and capacities of regional government?

Where the impacts are most apparent?

### *Rationale for case selection:*

Prague is a typical example of a larger capital city of a newer member state of the EU (accession after 2000) which is still being affected by its totalitarian history with centrally-planned social and economic development, focus on being a capital city, absence of democracy, free market and entrepreneurship. Those circumstances contributed to exceptional concentration of science, research, education and related organizations and facilities in Prague. Nowadays, the city is therefore a natural centre of science promotional activities in the Czech Republic.

Available data shows that Prague is a major centre of science, research and education facilities of the Czech Republic. This also means high concentration of people that work in research, development, innovation and related activities and who have a natural affection for all things new and are more open to novelties in all forms. People whose response to information on science related topics is generally higher than is usual in the country as a whole.

### *Factors for case study elaboration:*

In relation to the Prague Regional Innovation Strategy (RIS) that is in the process of update since last year, participation in the PLACES project in the form of science city case study seems a suitable complementary step.

As thematic area „People“ in the RIS that includes promotional activities related to science, research and entrepreneurship, closer analysis of SCIP aspects at regional level can present valuable base for development of suitable measures and projects.

## **2. Methods**

The study focuses on Prague as a science city and the chosen research questions led to selection of methods and modules deemed most suitable for this purpose. Out of modules offered by the PLACES Toolkit<sup>1</sup>, document analysis (Module B2) and semi-structured interviews (Module B1) were used.

Document analysis was used to further examine and elaborate the findings on the situational context of science communication policy in Prague and its socioeconomic characteristics. Analysis provided us with useful data describing both the general situation of Prague as regards research, development and innovation environment and more closely subjects active in science communication and related policies and initiatives.

For examining the general situation we used public data<sup>2</sup> from the Czech Statistical Office (CZSO), ad hoc data provided by the CZSO to the City Development Authority Prague (see Annex I in both cases), official documents of the City of Prague (Prague Strategic Plan<sup>3</sup> etc.) and to a lesser extent other data found in professional magazines or websites. As regards science communication, the above-mentioned sources were supplemented by outputs of the MASIS project (Monitoring research and policy activities of science in society) which focused on mapping of science awareness activities (see Annex II).

Module B2 (PLACES Toolkit 2011) was used as a standard tool with which the authors of this study are well acquainted with and have a thorough knowledge of what kind of data CZSO and other mentioned sources can offer. Under these circumstances, use of this module seemed to be a suitable time-efficient and cost-effective approach to proceed with study elaboration.

<sup>1</sup> *PLACES Toolkit for the Impact Assessment of Science Communication Initiatives and Policies* [online]. 2011. Available at: <<http://www.occ.upf.edu/img/imatges/cms/TOOLKIT%20MAY%202012.pdf>> [cit. 8. 5. 2013]

<sup>2</sup> *Yearbook (2012): Indicators of Science, Research and Innovation in the Czech Republic in 2011*. Prague: Czech Statistical Office 2012.

<sup>3</sup> *Strategic Plan for Prague 2008 Update* [online]. 2008. Available at: <<http://www.urm.cz/en/strategy-of-development>> [cit. 2. 8. 2012]

After consideration, Module B1 (PLACES Toolkit 2011) was chosen to consult selected experts and gather a sample of professional opinions on the topic of the study. The experts come from local authority, research institutes, education and business sphere. The aim was to approach representatives of all those categories in order to get a more complex picture of the issue. The choice was based on their respective expertise and experience in both science-related policy and practise of science communication. Expert opinions were thus gathered using a questionnaire with some additional clarifications communicated via e-mail afterwards.

Experts were chosen as follows:

- 1 representative of local authority (City of Prague);
- 1 representative of academic research institution (Academy of Sciences);
- 1 representative of business sphere (representing Association of SMEs of the Czech Republic);
- 1 representative of science communication facility (Centre of Administration and Operations of the Academy of Sciences);
- 1 representative of universities and professional association (Czech Technical University, Association of Research Organizations).

From the sum of their opinions, common observations and conclusions served as a main basis for drawing up answers to research questions of this study and the resulting recommendations. Furthermore, another European project with similar focus, CASC – Cities and Science Communication, was used to help formulate the recommendations.

Questions regarding opinion of the respondent on the future development in a given field often produced very general answers as a qualified answer would require “foresight approach” or thorough thinking about the issues. Both are unsuitable for questionnaire which usually has a limited timeframe for fulfilment. Even in the semi-structured interviews, we consider certain questions unsuitable for generating more insightful answers.

### **3. Results**

This part presents findings related to research questions posed in part 1.

*Question 1: Does science communication in Prague have a discernible regional dimension?*

Based on findings described below in Question 2, we conclude that regional dimension of science communication exists and can be related to. On the part of regional (in this case municipal) administration, opportunity for initiative is substantial as the administration can influence primary and secondary education institutions and many cultural institutions (museums, libraries etc.). Research organization and universities can also act within the region as various events organized by them take place in Prague and therefore influence local public the most.

*Question 2: What are the impacts of SCIP in the 4 pre-defined areas?*

a) policy

The environment of science communication policy (meaning mainly publicizing and popularization) in the Czech Republic is not formed by a common national policy with a dedicated institution with specific commission for this field of activities. Only certain measures in the National Research, Development and Innovation Policy<sup>4</sup> are focused on these issues. It is rather a sum of endeavours of various organizations, groups and individuals with different focus and rate of influence. Institutions with nation-wide renown and activities, many of which are seated in Prague, naturally cover a wider public, be it general or professional one.

This represents an opportunity for the Prague region to develop its own regional policy. With increasing attention that is being given to R&D&I in recent years, new forms of financial support are being provided, especially from the level of the European Union. EU also puts increasing emphasis on mobilization of regional comparative advantages and local resources to spur economic recovery and development. The concept of “science in society” that projects the role of science communication policy in regional/local community can be perceived as an evidence-based approach in governing local agendas both at official (regional/local government) and informal (business, non-profit sphere) level. As such science communication seems a natural part of R&D&I regional policy.

The science communication in Prague was developing together with SCIP on national level reflecting the radical changes initiated by major reforms of the Czech R&D systems, including also the more or less extensive decrease in funding. The significant reduction of ASCR staff in 1993 (50% for

<sup>4</sup> *Analyses for implementation and update of National Research, Development and Innovation Policy of the Czech Republic*. Prague: Technology Centre AS CR [online]. 2011. Available at: <<http://www.vyzkum.cz/FrontClanek.aspx?idsekce=13634>> [cit. 8. 5. 2013]

ASCR as a whole, some institutes were abolished completely) had been seen namely in Prague. On the other hand, new high schools and universities were established there since the second half of 1990s. Also the privatization of the business enterprise sector in the sphere of research and development (the voucher privatization form) in Prague region was carried out within the framework of the so-called “big privatization”, and it was finished in two waves in 1990s.

Many traditional platforms of popularization of science (namely newspaper sections and journals) ceased to exist because they were not able to survive in the new market economy. The transformed or new media are sometimes criticized by scientists for being too shallow and entertaining rather than informative, whereas scientists are criticized by journalists for being unable to do any kind of systematic popularization on their part.

In examining the potential of science communication, however, one also cannot leave aside certain fundamental characteristics of Czech society that applies to majority of the population. These have consequences on science communication efficiency and reception. Czech society is one with quite low share of religious people, hence “scientific” or “common sense” approach to life is relatively deeply anchored among the population and the need to “measure and weight” things and phenomena is common. This reflects in behaviour of people both in their professional and private life.

Two additional aspects can be added to the description of Czech specifics. First, no significant change can be expected in upcoming years as the above-mentioned feature of Czech society has a substantial level of inertia. Second, the Czech Republic’s population of 10 million is too small for this general aspect to have important regional differences.

Observations listed above provide a basis for the role of regional administration in science communication policy. Prague city administration operates various scientific and cultural organizations and facilities (museums, libraries etc.) that allow for contact of the general public with scientific and technical knowledge and discoveries. Public primary and secondary schools also fall under city administration’s jurisdiction and so educational policy can be to a significant extent influenced that forms pupils and students up to 19 years of age as far as their perception of science and its role in society is concerned. City government also supports independent organizations with relevant similar activities (especially various non-profit organizations and civic associations) through provision of grants and similar financial support. All these institutions are perceived as an inseparable part of Prague –

the city of culture. And science is, by one of the PLACES project definitions, form of culture.

Given the large concentration of institutions relevant to science and education, we conclude that regional dimension of science communication policy in Prague exists. More so as at present, these institutions are the most active in science communication activities. Though, such activities arise mainly from individual efforts rather than be based on unified policy. As domestic and especially international marketing of Prague as a Central European centre of science will be part of Regional Innovation Strategy (RIS) implementation, with Prague's renown abroad it can become a "brand" interchangeable for the Czech Republic in various research fields.

Support of scientific communication policy is expected to become one of the pillars of activities that Prague will implement following the completion of its RIS update. It will be an umbrella over activities the city will be supporting, ranging from more "traditional" support of research sphere to new topics such as social innovations which seem to be especially suitable and topical for cities and urban areas. The updated RIS shall also provide a framework and pilot projects for those activities related to science communication that will lead to promotion of Prague as a national and Central European centre of science and innovation and to promotion of science as socially beneficial career path for an individual and as a source of sustainable economic prosperity for the city.

#### b) Social and economic impacts

Social and economic impacts of science communication policy are mainly long-term in nature and as such require long-term approach in their implementation. The presence of science in society affects directly or indirectly social relationships and stimulates public-private interaction.

In the long term, the main goal of promotional activities is to attract young people to science and influence decision on their future career. And as science and innovation-driven economy is deemed to be source of European competitiveness, increasing the number of graduates ready to employ creativity and innovations in their professional life is a valuable contribution of science communication. Demand on the labour market for graduates with background in natural and technical sciences is increasing, following fast development in human knowledge and technology. Public policies begin to reflect this trend with increasing resources being dedicated to adapt to the new situation. These economic repercussions can be seen behind the effort of Prague to stimulate co-operation between schools, enterprises and

research organizations, which is embedded in city's key strategic documents (Strategic Plan for Prague, Regional Innovation Strategy). Non-profit sphere can also provide valuable input and ways are being developed to allow for its more active participation.

Science communication is also developing independently from public policies to some extent. This is a result of omnipresence of IT technologies which allow for easy communication and are key element for easy diffusion of science-related knowledge and information. Contemporary IT-based tools function as an interface between general public and professionals. Easy access to information has become an ordinary element of our lives. On the other hand, the volume of communication activities tends to decrease our ability to study information in greater detail resulting in its superficial absorption. Management of science communication is therefore important to help set up respected communication channels.

As already mentioned, the increasing role of science in society leads to setting up new sources of funding on the part of public administration. European policies are the main driving force behind this as well as contemporary economic reality. In Prague, during the last years, significant funds were disseminated that were provided from EU Structural Funds<sup>5</sup>. Science related activities received major support that would otherwise not have been available from the city budget itself as in the Czech Republic, R&D&I policy is mainly domain of central government. EU cohesion and R&D policy thus provided a stimulus that hastened development of support measures at both national and regional level.

Infrastructure built with this support in Prague will be accompanied by further promotional activities multiplying the effects described above. To list a few examples where EU co-funded projects relate directly to science communication, we can name the Information Centre of Academy of Sciences for general science communication and "Power for Competitiveness" project of Technology Centre ASCR aimed at professional public.

Promotional events organized by Academy of Sciences are one example when general public can directly communicate with R&D sector. Same is true for various web pages addressing different scientific topics, regardless of their institutional (official) or individual (private) origin. Detailed list of activities was elaborated in the course of the project "Monitoring Policy

<sup>5</sup> Operational Programmes for EU Structural Funds support in Prague – website: [www.prahafondy.eu](http://www.prahafondy.eu)



and Research Activities on Science in Society in Europe” (MASIS)<sup>6</sup>; see Annex II.

To conclude, science communication activities have impacts, among others, on the relationship of public to science, on approach of pupils and students to their future career and on decisions of public authorities on allocation of their financial resources and prioritization of their respective activities. This means that better understanding of science and what it can offer to society can improve quality of both public and private decision-making.

### c) Quality of Life

Within PLACES project context, this part refers mainly to public participation, media activities and cultural identity.

There are no formalized procedures of public engagement (grounded in legislation, in governmental or Prague management structures or in Prague municipality measures) focused specifically on R&D&I in the Czech Republic;<sup>7</sup> it is only possible to file specific petitions. Public debates (public hearings) oriented on the general public and civil organizations have not yet become part of public life in Prague. However, there are initiatives trying to open public debates on the part of civic society. In general, public engagement is an important trend influenced by examples coming from advanced European countries, one that public authorities are trying to respond to and make efficient use of.

To name one example, in 2009, debates with the participation of the public took place in response to the proposal of a new budget for the Academy of Sciences, which was 20% lower in comparison with 2008 and was projected to be 50% lower in 2012. There were public debates involving officials representing scientific and educational institutions, the government and industry, which dealt with the actual ratio of institutional and project funding, basic and applied research, the levels of applicability of results in research and industry. New civic initiatives aimed at supporting science in society have come into being (e.g. Forum Science Is Alive!<sup>8</sup>).

The current intensity of public interest in political debates about science, R&D and new technologies and their impact in the given society in the

<sup>6</sup> MASIS project (Monitoring research and policy activities of science in society) [online]. 2010. Available at: <<http://www.masis.eu/english/home/>> [cit. 8. 5. 2013]

<sup>7</sup> See National report of the Czech Republic [online]. 2010. Available at: <<http://www.masis.eu/english/storage/publications/nationalreports/masisnationalreportczechrepublic>> [cit. 8. 5. 2013]

<sup>8</sup> Forum “Science Is Alive!” (“Fórum věda žije!”) website <http://vedazije.cz/en>

Prague region is rather low. The main reason is the contemporary economy and financial crisis and related financial cuts and public savings. In general, the Prague public learns about S&T decisions and developments via the mass media. As regards the scientific community, it may be said that citizens are consulted, and their opinions are considered in S&T decision-making.

The most frequent topics included in the debates are the following: climate change, the environment, energy policy, reform of tertiary education, broader national strategies for science and research development and various issues related to knowledge-based economy. Main result of public participation is realization of the existing problem and discussions on possible approaches, problems and clarifications of attitudes of parties involved. The extent of public participation is expected to slowly increase in the future, depending on the ability of science community and media to articulate relevant topics and issues.

Scientific culture in Prague is formed by Prague being the capital of the Czech Republic and by its long tradition of science at Prague universities and, since mid-20<sup>th</sup> century, also at the Academy of Sciences. Region of Prague was analysed in the research study of Technopolis with the results describing the “science city” features of Prague. The main conclusion was that the Capital Prague stands out from the other Czech regions, being typical representative of Type “Science & Service Centre”.<sup>9</sup> Prague with a population of around 1.2 million is by far the largest Czech city. It serves as a national centre of business services, government administration, public research institutes and higher education.

However, historic tradition is related mainly to former Prague industrial base. More contemporary notion of tradition related to science and reflecting present socio-economic development is only slowly spreading among the general population.

#### d) Education

As Prague is an educational centre of the country, educational activities are a strong impulse for development of science communication activities. Recently, around 60% of secondary school graduates apply for admission to tertiary education institutions. Unfortunately, this trend - supported by

<sup>9</sup> *Strategic Evaluation on Innovation and the knowledge based economy in relation to the Structural and Cohesion Funds, for the programming period 2007-2013* [online]. 2007. National Report for the Czech Republic available at: <[http://ec.europa.eu/regional\\_policy/sources/docgener/evaluation/pdf/evalstrat\\_innov/czechrepublic.pdf](http://ec.europa.eu/regional_policy/sources/docgener/evaluation/pdf/evalstrat_innov/czechrepublic.pdf)> [cit. 8. 5. 2013]

way of public funding of universities - has detrimental effects on quality of university graduates as regards their readiness for practise.

Significant share of students apply<sup>10</sup> for social sciences and humanities whereas the needs of the economy and labour market lie more in natural and technical sciences. On the side note, share of students of Prague tertiary education institutions (public and private) on the country's total accounts for around 40%.

Lifelong learning initiatives are also developing in larger numbers as strong intellectual potential of tertiary education will generate courses for both the public and firms. The non-saturated demand for certain qualifications of graduates (e.g. soft skills) is one of the driving forces.

New and growing initiatives of research organizations that want to attract present and future students and graduates are being developed. The project Open Science<sup>11</sup> can be considered as another good practice with a focus on science education in schools. This project aimed at attracting especially secondary schools students to pursue scientific careers, namely in natural and technical sciences. Efforts of R&D workplaces to open to public are expected to increase. For example, number of school excursion is increasing. Scientific events are organized during the Week of Science and Technology<sup>12</sup>. New sponsors are interested in participation in such events which further strengthens the campaign. However, systematic approach to "detect" and work with talented young people should be behind these efforts, not only self-presentation.

*Question 3: What are suitable tools for SCIP with respect to competencies of regional government?*

Competencies of regional and local authorities in the field of scientific communication are not stipulated in Czech legislation. Therefore, it is either up to voluntary initiative of these authorities or with relation to their other competencies (e.g. primary and secondary education) to exercise measures that support SCIP.

As in many other policy fields, regional science communication policy should be, in ideal circumstances, based on relevant national policy. Such specific policy exists only in the form of rather generally formulated

<sup>10</sup> *Yearbook (2008): Statistical Yearbooks of Czech Education 2007*. Prague (Institute for Information in Education), CD-ROM

<sup>11</sup> Open Science II [online]. Available at: <<http://www.otevrena-veda.cz/index-en.html>> [cit. 8. 5. 2013]

<sup>12</sup> Week of Science and Technology website: <http://www.tydenvedy.cz/index.jsp>

measures in National Research, Development and Innovation Policy for 2009-2015. Prague administration can therefore rely only on various related national policies in the field of R&D&I, education etc. and their particular objectives and measures.

Leaving aside systematic measures and complex projects, we observed that tools offering direct personal experience for participants (promotional events, excursions, exhibitions etc.) seem to have a potential for more profound effect or response on the part of target group.

*Question 4: Where the impacts of SCIP are most visible?*

According to our findings, main recent general outcome of identified SCIP activities is their growing numbers. Increasing frequency positively affects their perception by the public, makes them more ordinary part of cultural life in Prague. What is more important, numbers of (young) people who participate in events and visits to scientific workplaces are increasing. Number of marketing products (website, leaflets, TV shows etc.) also increases. All this makes science more and more common part of life which is one of the general objectives of the SCIP.

Still, there is space for the SCIP to aspire to have more concrete outcomes relating to socio-economic development of both the country and the city.

#### **4. Conclusions**

There is a growing interest within the Prague public in the issues of spiritual, philosophical, cultural and ethical nature, issues that seem to stem from a greater appreciation of the actual weight of cultural and moral values and the human dimension in all walks of life. Furthermore, these issues are connected with an urgent need to restore its local cultural-historical traditions, while safeguarding the development of what are seen as unique and irreplaceable local studies. These topics come primarily under the heading of humanities, and today's rising interest in these branches – especially among young and well-educated people – is highly visible in the public in Prague.

Seen in this context, the relationship between expert opinion and democratic decision-making appears to be of great importance. At present, scientific expertise is known to exercise only occasional and limited influence on the political decision-making process of the Prague City Hall.

The public in Prague does not perceive “science” in all its relevant factors but rather considers individually the various unique aspects connected to it. In the public opinion polls a “scientist” belongs traditionally among the

most prestigious occupations (ranking second behind physicians, while university teachers rank third). Until recently, the questions of science policy and science funding were not a subject of serious public debate. But from the middle of 2010 we could say that they present an “important” agenda, however, it is being pushed aside by the social and economic problems caused by the economic depression.

Generally, the dialogue between science and society and the Science Communication Initiatives and Policies supporting it is a key issue. Often, they talk about the necessity of a new alliance between science and society on all societal levels. As far as Prague is concerned, such a vital dialogue has been so far replaced by efforts to popularize science and well-meant endeavours aimed at making the general public understand science and its importance. But a genuine dialogue needs a two-way model, i.e. efforts to win over public understanding for science should be supplemented with endeavours to make scientists understand public attitudes as well.

Nevertheless, the Science Communication Initiatives and Policies can play a valuable role in regional dimension. In Prague, we identified (based also on project MASIS findings) initiatives of various bodies (universities, Academy of Sciences) in science communication that can influence the perception of role of science in daily lives of citizens and workers in the city. Clearly, promotional activities can ease articulation of what science has to offer to a common person and society as a whole.

To maximise effects of science communication there is a space for national and regional authorities to play an integrating role in the form of elaborating and implementing suitable national and regional policies with appropriate focus. Through influence of public authorities on many research institutions and on educational system, they could help create respected communication channels for systematic promotion of science and its role in society.

The city of Prague expects to develop some kind of science communication policy together with implementation of its Regional Innovation Strategy that is being updated since last year. With this strategy in place, Prague aspires to promote itself as a Central European centre of science and innovation and exploit its comparative advantages in competition with relevant cities in neighbouring countries (Vienna, Munich etc.) with similar aspirations.

## 5. Recommendations

Ambition of this study is to put forward recommendations focused on regional level, however, the first recommendation calls for national umbrella framework for Science Communication Initiatives and Policies (SCIP) activities. On the other hand, if the regional government wants to take initiative within its remit, non-existence of national policy should not constitute an obstacle.

- Elaborate national science communication policy.
  - National science and communication policy should motivate more both the public and scientists towards dialogue. But such a dialogue must be genuine and necessitates a two-way model, i.e. efforts to win over public understanding for science should be supplemented with endeavours to make scientists understand public attitudes and needs as well.
- Elaborate regional dimension of national science communication policy.
  - Most effective Science Communication Initiatives and Policies in Prague, which would support future scientific and innovation culture should systematically and intensively support innovative entrepreneurship in Prague region. It should be accompanied by popularisation of positive results and explanatory communication of examples of the “best practice”. This type of popularisation activity could bring more communicable and understandable comprehensibility of both real and potential effects of research and technology development. Development of SCIP for Prague could motivate higher participation of the public in decision processes and implementation of solutions for the key problems in Prague.
    - The potential for public-private interaction is substantial in Prague. If it is stimulated through SCIP, it will lead to development of science and innovation culture and subsequently to improvement of city’s competitiveness.
- Emphasize personal experience in science communication – place substantial focus on events where people can “meet with science” in person.
  - New modes of SCIP; scientists understand public attitudes and are going close to public (TV periodical programmes, shows, exhibitions, street activities).

- Popularisation events organized by research organizations in Prague are becoming more and more frequent. Their positive influence on the awareness of local public, on encouragement of young people in their interest in science, research and technologies is undeniable. However, so far, they tend to be more a one-way communication campaigns instead of a two-way discussion on the society's priorities.
- *Follow recommendations of the CASC Project<sup>13</sup> aimed at strengthening public participation in science, in particular:*
  - Promote science through partnerships between scientists and corporations.
  - Invest in science educators and communicators.
  - Strengthen links between science professionals and the media.

<sup>13</sup> EUCASC Project website <http://www.eucasc.eu/theproject.html>

## ANNEX I – MAIN INDICATORS OF R&D&I IN PRAGUE<sup>14</sup>

Table 1: *Main indicators of science, research and innovation environment in Prague*

Indicator	2005	2006	2007	2008	2009	2010	2011
GDP per capita in PPS as percentage of EU-27 average	159	162	172	174	n. a.	n. a.	n. a.
Work force (thousand persons)	637.5	645.2	648.2	658.1	680.8	682.4	674.8
Persons with tertiary education as share of work force (%)	28.5	28.2	28.4	32.1	31.4	35.1	38.0
Number of universities (public/private)	9/20	9/20	9/22	9/24	9/23	9/24	n. a.
Number of university students	127,434	128,300	136,598	148,931	149,830	154,036	152,972
Share of employed in tertiary sector (%)	79.1	79.2	81.4	80.4	79.8	81.6	82.6
Professionals (CZ-ISCO-88) (thousand persons)	142.9	147.2	152.3	153.1	147.0	157.6	n. a.
Researchers (HC) as share of economically active population (%)	2.58	2.73	2.96	3.00	2.67	2.61	2.78
GERD (million CZK) (million EUR <sup>1</sup> )	15,835 532	19,186 677	22,914 825	22,481 901	20,906 791	20,998 860	23,180 943
GERD as share of regional GDP (%)	2.11	2.36	2.52	2.30	2.21	2.16	n. a.
Number of R&D workplaces	591	594	626	614	627	657	670
Share of firms with innovation activities (%) <sup>2</sup>		48.3		50.5		54.6	

Sources: Czech Statistical Office, Eurostat, Czech National Bank, City Development Authority Prague, Community Innovation Survey

Note on used abbreviations:

HC – head count;

GERD – gross expenditure on research and development;

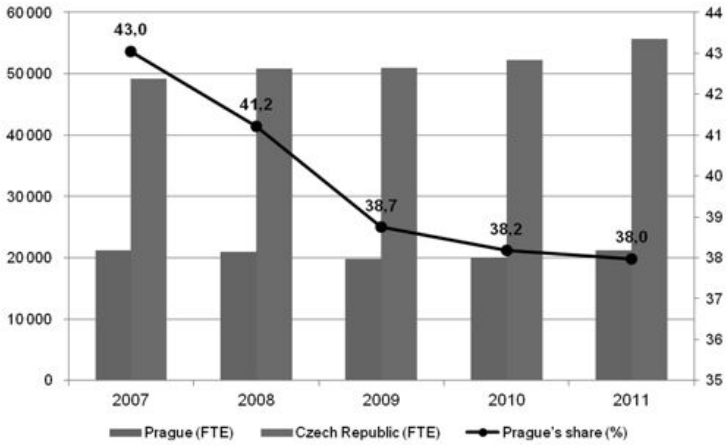
PPS – purchasing power standard;

n. a. – data not available

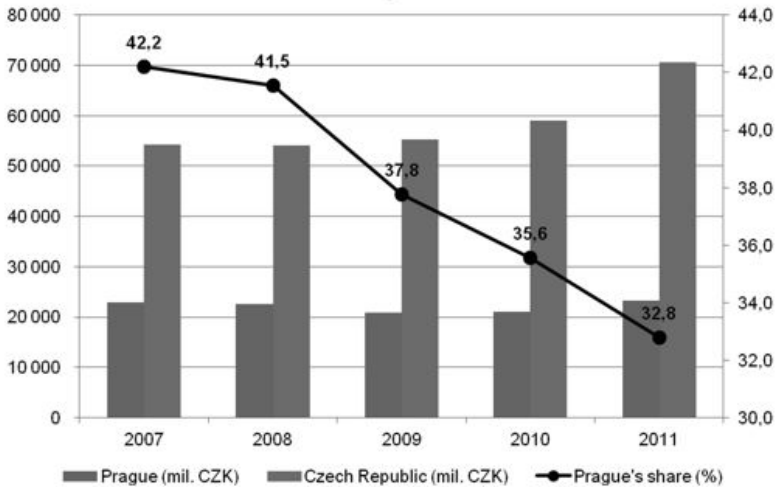
<sup>14</sup> The Annex 1 was elaborated by Jakub Pechlát, based on the cited statistical data and the study R&D&I in Prague – Analysis of regional data (in Czech), City Development Authority Prague, Prague 2010, see more on <[http://www.urm.cz/uploads/assets/soubory/data/strategicky\\_plan/Analyzy/vavai\\_v\\_praze\\_2010.pdf](http://www.urm.cz/uploads/assets/soubory/data/strategicky_plan/Analyzy/vavai_v_praze_2010.pdf)> [cit. 8. 5. 2013]



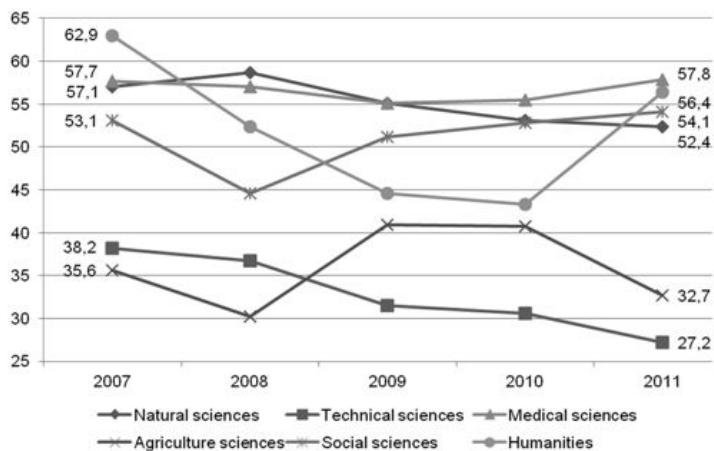
Graph 1: *Employees in R&D in Prague and the Czech Republic*



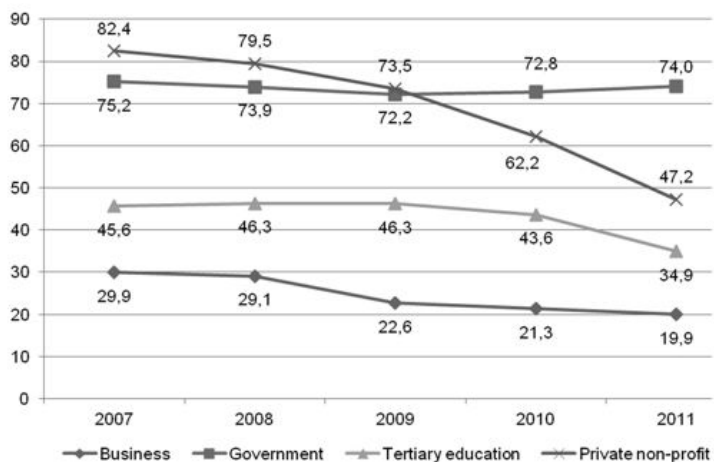
Graph 2: *R&D expenditure in Prague and the Czech Republic*



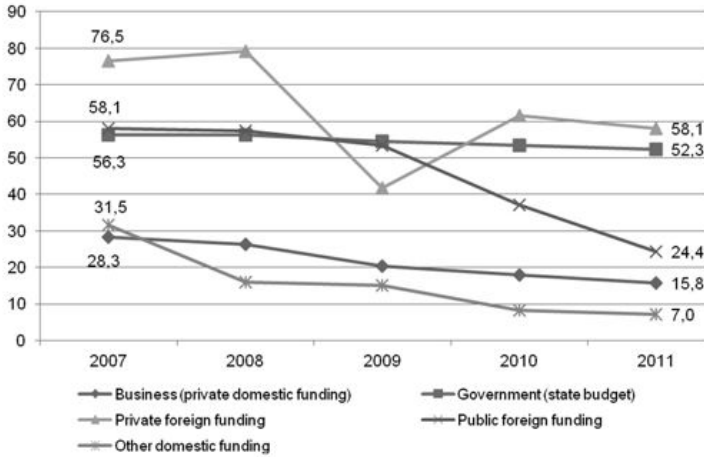
**Graph 3: Share of Prague's R&D expenditure in selected research branches (in % of Czech Republic's total)**



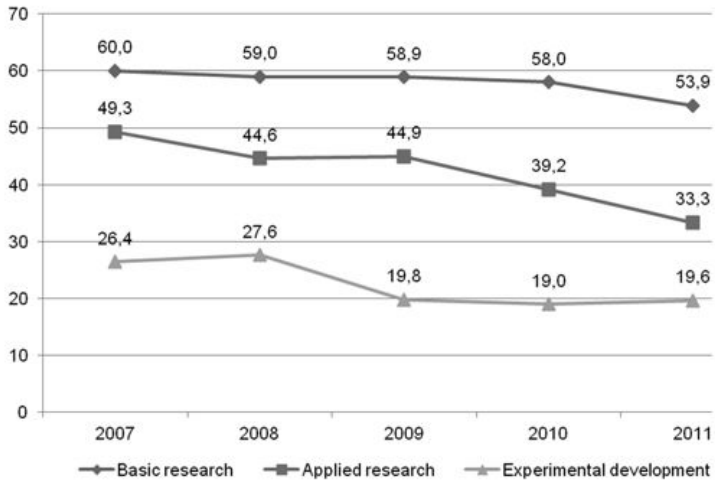
**Graph 4: Share of Prague's R&D expenditure in selected sectors (in % of Czech Republic's total)**



Graph 5: *Share of Prague's R&D expenditure by sources of funding (in % of Czech Republic's total)*



Graph 6: *Share of Prague's R&D expenditure by type of research (in % of Czech Republic's total)*



Source: Czech Statistical Office (for all Graphs 1-6)

## ANNEX II – SCIENCE COMMUNICATION ACTIVITIES IN THE CZECH REPUBLIC

This Annex is based on findings of the MASIS Project, see more detailed National report of the Czech Republic available at: <<http://www.masis.eu/english/storage/publications/nationalreports/masisnationalreportczechrepublic>> [cit. 8. 5. 2013]; cf. part 4, p. 33–43.

### 1. Festivals, science weeks, etc.

Activity title (and web-link if possible)	Activity type	Organiser	Frequency	Number of participants (approx)	Venue (city/region-/national)	Short description
A Week of Science and Technology <a href="http://www.tydenvedy.cz/">http://www.tydenvedy.cz/</a>	Science-week	Academy of Sciences of the Czech Republic	Once a year	30.500 (in 2009)	National (7 cities)	Lectures, seminars, presentations, exhibitions, workshops for general audience
Academia Film Olomouc <a href="http://afo.cz/">http://afo.cz/</a>	Science Film Festival	University Palackeho, Olomouc	Once a year	2.000	Olomouc	Festival of popular-scientific and documentary films
European Philosophy Festival <a href="http://festivalfilosofie.webnode.cz/o-nas/">http://festivalfilosofie.webnode.cz/o-nas/</a>	Philosophy Festival	Masaryk University, Academy of Sciences	Once a year	1.000	Velké Meziříčí	Popularization of philosophy and literature based on public discussions.
Czech Days for European Research <a href="http://www.tc.cz/detail-event/id-1271/">http://www.tc.cz/detail-event/id-1271/</a>	Presentations, conference	Academy of Science, Technology Centre of ASCR	Once a year	500	National	Presentations of research centres to students and public.
Academy of Science Open Days <a href="http://press.avcr.cz/sys/search.jsp">http://press.avcr.cz/sys/search.jsp</a>	Presentations of AS Institutes	Academy of Science	Once a year	5.000	National	Presentations of research centers to students and public.
European Night of Scientists <a href="http://www.nocvedcu.cz/">http://www.nocvedcu.cz/</a>	Presentations of AS Institutes	EU, Academy of Science	Once a year	6.000	National	Presentations of research centers to students and public.

European Week of Brain	Lectures	Academy of Science and Charles University	Once a year		Prague	Presentations of news from neuroscience
Science Festival Brno <a href="http://www.vojenskaskola.cz/school/ud/university/Pages/events_schedule.aspx">http://www.vojenskaskola.cz/school/ud/university/Pages/events_schedule.aspx</a>	Presentations	Academy of Science, Masaryk University	Once a year	3.000	Brno	Lectures and presentations for general public.
Pilsen Days of Science and Technology <a href="http://www.fst.zcu.cz/en/o-fakulte/prezentace-FST/akce-FST.html">http://www.fst.zcu.cz/en/o-fakulte/prezentace-FST/akce-FST.html</a>	happening	City of Pilsen	Once a year	2.000	Pilsen	Lectures and presentations for general public.
Scientia Pragensis – Prague Day of Science <a href="http://www.sciprag.cz/">http://www.sciprag.cz/</a>	Presentations	Prague's Universities	Once a year	3.000	Prague	Lectures and presentations for general public.
Days of Arts and Science in Ústí nad Labem	Presentations	University of J. E. Purkyne	Once a year		Ústí nad Labem	Lectures and presentations for general public.

## 2. TV programmes

Programme title (and web-link if possible)	Frequency Pick from list: 1. Daily 2. Weekly 3. Monthly 4. Less than monthly	Duration (in minutes)	Target audience	Themes covered
Adventures of Science and Technology <a href="http://www.ceskatelevize.cz/program/1098111603-dobrodruzstvi-vedy-a-techniky.html">http://www.ceskatelevize.cz/program/1098111603-dobrodruzstvi-vedy-a-techniky.html</a>	2	26	Young and general audience	Various topics from history and contemporary science
Planet Science <a href="http://www.ceskatelevize.cz/program/10095530301.html">http://www.ceskatelevize.cz/program/10095530301.html</a>	2	22	general	Popular science
Backyard Science I, II, III (Australian series) <a href="http://www.ceskatelevize.cz/program/10096431862-veda-je-zabava.html">http://www.ceskatelevize.cz/program/10096431862-veda-je-zabava.html</a>	2	25	general	Popular scientific experiments

PORT <a href="http://www.ceskatelevize.cz/program/10121359557.html">http://www.ceskatelevize.cz/program/10121359557.html</a>	2	27	general	News from different fields of science and technology
Prism Prizma <a href="http://www.ceskatelevize.cz/program/10252893246.html?nzv=Prizma">http://www.ceskatelevize.cz/program/10252893246.html?nzv=Prizma</a>	2	30	general	Information from the world of science and technology; laboratories from around the world; new technologies, applied research.
Millenium <a href="http://www.ceskatelevize.cz/program/10252610809.html?nzv=Mil%E9nium">http://www.ceskatelevize.cz/program/10252610809.html?nzv=Mil%E9nium</a>	1	25	general	Futurological magazine introducing new-est trends in modern technologies, medicine, lifestyle, transport.
Living Heart of Europe <a href="http://www.ceskatelevize.cz/ivysilani/10121011820-zive-srdce-evropy/">http://www.ceskatelevize.cz/ivysilani/10121011820-zive-srdce-evropy/</a>	2 (3 times a week)	5	general	Information about engendered fauna and flora of Europe.
Don't Give Up <a href="http://www.ceskatelevize.cz/program/10267429305.html?nzv=Nedej+se">http://www.ceskatelevize.cz/program/10267429305.html?nzv=Nedej+se</a>	2	15	general	Ecological magazine.
Give In <a href="http://www.ceskatelevize.cz/program/10266832871.html?nzv=P%F8idej+se">http://www.ceskatelevize.cz/program/10266832871.html?nzv=P%F8idej+se</a>	2	15	general	Ecological magazine.
Diagnosis <a href="http://www.ceskatelevize.cz/program/diagnoza/">http://www.ceskatelevize.cz/program/diagnoza/</a>	2	15	general	Popular medicine.
History.cs <a href="http://www.ceskatelevize.cz/program/10252562955.html?nzv=Historie.cs">http://www.ceskatelevize.cz/program/10252562955.html?nzv=Historie.cs</a>	2	55	general	Series about important historical moments from modern Czechoslovak and Czech history after 1918.
Chapters about vermin <a href="http://www.ceskatelevize.cz/program/10214729714.html?nzv=Kapitolky+o+hav%ECti">http://www.ceskatelevize.cz/program/10214729714.html?nzv=Kapitolky+o+hav%ECti</a>	2	10	children	Popular scientific documentaries for kids.
Medicine for 21 <sup>st</sup> Century <a href="http://www.ceskatelevize.cz/program/10283905824.html?nzv=Medic%EDna+pro+21.+stolet%ED">http://www.ceskatelevize.cz/program/10283905824.html?nzv=Medic%EDna+pro+21.+stolet%ED</a>	2	15	general	Popular medicine.
About Czech Language <a href="http://www.ceskatelevize.cz/program/10266244783.html?nzv=O+%E8e%9Atin%EC">http://www.ceskatelevize.cz/program/10266244783.html?nzv=O+%E8e%9Atin%EC</a>	2	25	general	Entertaining series about interesting aspects of Czech language.

Science is a Detective Story <a href="http://www.ceskatelevize.cz/program/10257332777.html?nzv=V%ECda+je+detektivka">http://www.ceskatelevize.cz/program/10257332777.html?nzv=V%ECda+je+detektivka</a>	2	25	children	Australian series about the mysteries of science for children.
Magical Planet <a href="http://www.ceskatelevize.cz/program/search.php?tov=Z%E1zra%E8n%E1+planeta">http://www.ceskatelevize.cz/program/search.php?tov=Z%E1zra%E8n%E1+planeta</a>	2	55	general	Series about planet Earth and its fauna.

### 3. Radio programmes

Programme title (and web-link if possible)	Frequency Pick from list: 1. Daily 2. Weekly 3. Monthly 4. Less than monthly	Duration (in minutes)	Target audience	Themes covered
Leonardo Czech Radio station devoted exclusively to science. Some of its programs are adopted by other stations. <a href="http://www.rozhlas.cz/leonardo/portal">http://www.rozhlas.cz/leonardo/portal</a>	1	Non-stop	general	Digital and online radio station devoted to popularization of science, technology, history, and medicine.
Science-Mosaic <a href="http://www.rozhlas.cz/mozaika/veda/">http://www.rozhlas.cz/mozaika/veda/</a>	2 (several times a week)	5	general	News from fields of science and technology
Meteor <a href="http://www.rozhlas.cz/meteor/portal/">http://www.rozhlas.cz/meteor/portal/</a>	2	50	general	Popular nature, space, science and technology
Periscope <a href="http://www.rozhlas.cz/praha/porady/_zprava/107191">http://www.rozhlas.cz/praha/porady/_zprava/107191</a>	2	25	Children and young	Scientific adventures for children.
Document <a href="http://www.rozhlas.cz/praha/porady/_zprava/234447">http://www.rozhlas.cz/praha/porady/_zprava/234447</a>	2	20	general	Documentaries from the worlds of science, nature, history.
Talks about science <a href="http://www.rozhlas.cz/cro6/porady/_zprava/102406">http://www.rozhlas.cz/cro6/porady/_zprava/102406</a>	2	30	General	News form Czech and international science and medicine
Centaury <a href="http://www.rozhlas.cz/cro6/porady/_zprava/102314">http://www.rozhlas.cz/cro6/porady/_zprava/102314</a>	2	30	General	Ecological magazine
Minute from the World of Science <a href="http://www.rozhlas.cz/sever/porady/_porad/3843">http://www.rozhlas.cz/sever/porady/_porad/3843</a>	5 times a week	10	General	New scientific discoveries.

Planetarium <a href="http://www.rozhlas.cz/planetarium/portal/">http://www.rozhlas.cz/planetarium/portal/</a>	2	15	General	Interviews with scientists, popularizers of science and alternative scientists.
From the World of Science <a href="http://www.rozhlas.cz/mozaika/veda">http://www.rozhlas.cz/mozaika/veda</a>	1	25	General	News and interesting information from the world of science.

#### 4. Popular science magazines:

Title (and web-link if possible)	Frequency Pick from list: 1. Daily 2. Weekly 3. Monthly 4. Less than monthly	No. of print runs	Target audience	Themes covered
21 <sup>st</sup> Century <a href="http://21stoleti.cz/">http://21stoleti.cz/</a>	3	85.000	general	Popularization of science and technology
Universe <a href="http://vesmir.cz/">http://vesmir.cz/</a>	3		general	Popularization of (namely natural) science
Life <a href="http://ziva.avcr.cz/">http://ziva.avcr.cz/</a>	4		general	Popularization of biology
World <a href="http://www.epublishing.cz/svet">http://www.epublishing.cz/svet</a>	3		general	Popularization of science and technology
Realm of Stars <a href="http://www.rishevvezd.cz/">http://www.rishevvezd.cz/</a>			general	Popularization of astronomy
Astropis <a href="http://www.astropis.cz/">http://www.astropis.cz/</a>	4		general	Popularization of astronomy
Technics Weekly <a href="http://www.techtydenik.cz/">http://www.techtydenik.cz/</a>	2		general	Popular technics and technology
VTM science <a href="http://www.vtm.cz/">http://www.vtm.cz/</a>	3		young	News from science, technology and nature.
ABC <a href="http://abc.blesk.cz/kategorie/1312/casopis-abc">http://abc.blesk.cz/kategorie/1312/casopis-abc</a>	Once very two weeks		Children and young	Technical and natural sciences for young audience.



## 5. National portals, blogs

Activity title (and web-link)	Activity type	Number of users (if known)	Themes covered	Short description
Academy of Sciences of the Czech Republic <a href="http://www.cas.cz/">http://www.cas.cz/</a>	Presentation of the main scientific institution in the Czech R.		All areas of research	Presentation of the Czech Academy of Science and its 53 institutes (each has its own web presentation).
Research <a href="http://www.vyzkum.cz/">http://www.vyzkum.cz/</a>	Portal of the Scientific Council of the Government of the CR		News from science policy in the Czech Rep.	Presents information about the national science policy and the activities of the Scientific Council
"Science Is Alive!" <a href="http://www.vedazije.cz/">http://www.vedazije.cz/</a>	Civic forum for promoting communication among scientists, government, NGOs, and public		All areas of research	Aims to promote better communication among different subjects dealing with science.
Scienceworld <a href="http://scienceworld.cz/">http://scienceworld.cz/</a>	Internet portal which tries to mediate between specialized journals and popular scientific journals		All areas of research	Daily news from all areas of research.
Osel <a href="http://www.osel.cz/">http://www.osel.cz/</a>	Internet portal for popularization of science		All areas of research	Popular news from all areas of research
Astro <a href="http://www.astro.cz/">http://www.astro.cz/</a>	Czech Astronomical Society portal		Universe	Information from astronomical research
Amavet <a href="http://www.amavet.cz/">http://www.amavet.cz/</a>	Association for youngsters, science, and technology		All areas of research	Popular news from all areas of research for young audience

## 6. Citizen- or Civil society organisations initiatives

Activity title (and web-link if possible)	Activity type	Frequency	Number of participants	Short description
"Science Is Alive!" <a href="http://www.vedazije.cz/">http://www.vedazije.cz/</a>	Citizen forum	5 times a year	10s - 100s	Aims to promote better communication among different subjects dealing with science.
Science Café <a href="http://sciencecafe.cz/">http://sciencecafe.cz/</a>	Discussions	Monthly	10s	Meeting of scientists and public in cafes and restaurants

Council of Scientific Societies of the Czech Republic <a href="http://old.cas.cz/rvs/">http://old.cas.cz/rvs/</a>	Society of the main scientific figures		10s - 100s	International and national congresses, conferences, seminars.
Czech Astronomical Society <a href="http://www.astro.cz/">http://www.astro.cz/</a>	Czech Astronomical Society		550 members	Interfaces between scientific and popular astronomy.
Czech Learned Society <a href="http://www.learned.cz/">http://www.learned.cz/</a>	Citizen forum		10s - 100s	Promotes research and its popularization