

DRESDEN
concept



SCIENCE EXHIBITION

Dresden–Prague

Science Unlimited

PROGRAMME

10 APRIL–4 MAY 2018

PRAHA 1, OVOCNÝ TRH

Imprint

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Sonja Piotrowski

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From Joint Projects to Strategic Alliances

SCIENCE UNLIMITED BETWEEN DRESDEN AND PRAGUE

PROF HANS MÜLLER-STEINHAGEN

Excellent cutting-edge research results are produced by strong teams of brilliant and innovative minds. The required alliances may not be found locally, frequently they stretch across regional and national borders. Therefore, it is essential for us to strengthen and to expand the scientific co-operation between Dresden and Prague for the mutual benefit of scientists and students from both countries.



Especially in today's globalised and highly competitive scientific landscape, the exchange of ideas knows no boundaries and strategic partnerships are both invaluable and indispensable. Due to the geographical proximity between Dresden and Prague, the expansion of our existing partnership is a natural corollary in order to coalesce the extraordinary excellence of our two research locations.

An essential pillar of TU Dresden's excellence is manifested around the DRESDEN-concept alliance of 26 partners from the world of science and culture. Yet from the very beginning, there was the desire and the necessity for an intensive networking with one common goal: to further enhance their performance through targeted collaboration and the utilisation of synergies. An additional benefit from this co-operation is that all partners gain more national and international visibility. Pooling their resources, conducting joint research projects and developing strategic research programmes marks this unique cooperative venture.

A particularly important aspect is that science is an enormous economic factor and innovation driver for the city of Dresden and the entire region. The strong development of local industries, start-up companies, new factories and research offices of established industrial players in and around Dresden are the result of the availability of highly qualified university graduates and outstanding research collaborations. Having achieved all this, DRESDEN-concept now strives to further develop its activities by strengthening international collaboration. With its broad research range, DRESDEN-concept provides excellent cutting-edge research

opportunities for students, PhD students and postdocs. Based on the extremely positive feedback from the huge number of Dresden visitors, it was decided to take the DRESDEN-concept Science Exhibition on an international tour. All good things come in threes: the cities of Wrocław, London and Prague have been deliberately selected due to their scientific reputation and potential for future co-operation. I am confident that this DRESDEN-concept research alliance provides manifold interesting research opportunities for interregional networking.

TU Dresden already enjoys long-standing partnerships with the Charles University, the Academy of Science and other research institutes in Prague. Alongside flourishing Erasmus exchange programmes, the research co-operation between individual academics has proved to be extremely fruitful. EU projects, interregional projects as well as co-operations with the different schools of the universities are measurable criteria for the partnership. This forms a solid foundation to be cemented and expanded in the years to come. Since the DRESDEN-concept science exhibition was on display, the exchanges with the universities in London and Wrocław have intensified and we hope that the science exhibition and the framework programme are also a fertile base to strengthen the ties between Prague- and Dresden-based research institutions.

Lectures invite doctoral students, postdocs and scientists from the Prague-based universities and the DRESDEN-concept partners to participate in an inspiring exchange of ideas. I expressly encourage you to be innovative, curious and creative and I truly hope there will be numerous occasions for exchange to follow with the common goal of learning from and with one another.



Prof Hans Müller-Steinhagen
*Rector of Technische Universität Dresden and
Chairman of the Board of DRESDEN-concept*

Strengthened partnership for future co-operation

PROF TOMÁŠ ZIMA

The core priority of Charles University is to enhance international co-operation with universities abroad as well as with non-university partners. Sharing best practices, lessons learned and mutual support is the key for successful development, not only for the universities but also for their students, researchers, and most importantly, for the society as a whole.



We are living in a fast-changing world that requires us to promptly react to new developments and challenges. Universities no longer provide *merely* education. They are also expected to contribute to the resolution of economic, social and environmental challenges. At the same time, higher education institutions need to adapt to new technological and demographic challenges. Therefore, it is vital that universities closely co-operate on interdisciplinary projects within Europe and across continents.

The DRESDEN-concept Science Exhibition is a unique alliance, aligning Technische Universität Dresden with Dresden-based, as well as with international partners in various fields that range from biomedicine and bioengineering, different technologies, new materials and structures, energy and urban development to culture and history.

Together with Technische Universität Dresden, Charles University drafted a work plan for co-operation until 2020 in the fields of intellectual property law, international private law in practice, natural sciences, post-transition economies, biomedicine, surgery and traumatology, ophthalmology, diagnosis and treatment of prostate cancer, history and other areas. The collaboration is primarily based on student exchanges and joint academic projects through our bilateral agreement, as well as the Erasmus+ programme.

On behalf of Charles University, I fully support all efforts focusing on co-operation in science, training and administration through intense academic mobility and exchange, preparation of research projects, as well as joint and double degrees. Let us get inspired at this very special occasion and throughout this exhibition. Let us use this opportunity for scientists from Dresden, Prague and elsewhere to exchange ideas, come up with new proposals, and develop and strengthen the partnership between our institutions and cities. Last but not least, I would like to wish for our researchers, academics and partners to be able to have many common and inspirational projects that will contribute to the development of our cities and societies.



Prof Tomáš Zima
Rector of Charles University

DRESDEN-concept

AN ALLIANCE FOR EXCELLENCE IN SCIENCE AND CULTURE

DRESDEN-concept is an alliance between the Technische Universität Dresden and non-university research institutions in Dresden. DRESDEN is an acronym for Dresden Research and Education Synergies for the Development of Excellence and Novelty. The active cooperation and the local proximity of the individual partners from the world of science and culture favour the development of synergies in research, teaching, infrastructure, administration and transfer.

DRESDEN-concept was established in 2010 in the context of the Excellence Initiative. Coming together in the DRESDEN-concept alliance further facilitated cooperations among the partners and promoted a synergistic network which is unique in Germany. A major aim is to develop scientific concepts for research areas where Dresden presently has, or likely will have in the future, a leading international position. Furthermore, the alliance implements scientific strategies.

The DRESDEN-concept partners have joined forces in selected priority research fields, with the goal of bundling their diverse strengths and achieving outstanding results. These efforts are in part undertaken in joint research centres. The research focuses are Biomedicine & Bioengineering, Information Technology & Micro-electronics, Materials & Structures, and Culture & Societal Change.



1  **TECHNISCHE
UNIVERSITÄT
DRESDEN**

2  **Universitätsklinikum
Carl Gustav Carus**
DIE DRESDNER.

3  **Fraunhofer
IPMS**

4  **Fraunhofer
FEP**

5  **Fraunhofer
IKTS**

6  **Fraunhofer
IWS**

7  **Fraunhofer
IVI**

8  **DZNE**
Das Nationale Zentrum für
transdisziplinäre Neurowissenschaften
in der Leibniz-Gemeinschaft

9  **HZDR**

10  **Leibniz-Institut
für ökologische
Raumentwicklung**

11  **Leibniz-Institut
für Polymerforschung
Dresden e. V.**

12 **SENCKENBERG**
world of biodiversity

13  **IFW**

14  **CBG**
Max Planck Institute
for Molecular Cell Biology
and Genetics

15  **mpipks**

16  **MAX-PLANCK-INSTITUT
FÜR GESCHICHTE DER
NATURWISSENSCHAFTEN**

17 **MILITÄR
HISTORISCHES
MUSEUM**
Dresden

18  **SLUB**
Wir führen Wissen.

19 **STAATLICHE
KUNSTSAMMLUNGEN
DRESDEN**

20  **DEUTSCHES
HYGIENE-MUSEUM
DRESDEN**

21  **HTW**
Hochschule für
Technik und Wirtschaft
Dresden
University of Applied Sciences

22 **LANDESAMT
FÜR ARCHÄOLOGIE** |  **Freistaat
SACHSEN**

23  **Fraunhofer
IZM**

24  **Fraunhofer
IFAM**

25  **Leibniz-Institut für
Material Science
Dresden**

26  **Leibniz-Institut für
Technologie
Dresden**

10 APRIL

14:00–16:00

PRAHA 1, OVOCNÝ TRH

OPENING EVENT

Dresden–Prague

Science Unlimited

DRESDEN-concept Science Exhibition

14:00 Opening of the DRESDEN-concept

Science Exhibition at Ovocný trh

In case of bad weather: Opening at Patriots' Hall (Vlastenecký sál)
in the Karolinum, Rector's building of Charles University, Ovocný trh

Panel discussion

Prof Tomáš Zima, Rector of Charles University

Prof Müller-Steinhagen, Chairman of the DRESDEN-concept Board and
Rector of TU Dresden

Adriana Krnáčová, Mayor of Prague

Dirk Hilbert, Lord Mayor of Dresden

The talk is hosted by Prof Schultz,

Head Office Manager of DRESDEN-concept

14:20 Guided tour of the exhibition

14:45 **Transfer** to Patriots' Hall (Vlastenecký sál) in the Karolinum,
Rector's building of Charles University, Ovocný trh

14:50 **Welcome address** by Christiana Markert, Deputy ambassador of
Germany and Tomáš Jan Podivínský, ambassador of Czech Republic

Open discussion with drinks & snacks

16:00 **End of the official programme**

→ Tangible Science – from July until October 2016, residents as well as visitors to the State capital Dresden were able to personally discover and explore cutting-edge research results – around-the-clock and right in front of the famous Frauenkirche, located on the Neumarkt square.



23 APRIL

17:00–19:00

INSTITUTE OF TRANSLATION STUDIES,
HYBERNSKÁ 3, ROOM 206

The Language of Neighbours

LECTURE

The lecture cycle is devoted to the historical phenomenon of Czech-German bilingualism in the Czech lands and the current state of the German language in the Czech Republic. The presentations highlight the problem of language choice and change among Jewish writers in the 19th century, as well as the status of German as a minority language from a current and historical perspective. In addition, a study on the role of German as a mediating language in the translation of Czech literature into Spanish will be presented.

The Institute of Translation Studies at Charles University is the oldest and most important Czech institution of its kind.



Dr Tomáš Svoboda is head of the German department at the Institute of Translation Studies, Charles University. He is the coordinator of the double degree programme in collaboration with Leipzig University and a board member of the European Master's in Translation network, coordinated by the EC.



Dr Petra Mračková Vavroušová teaches interpreting at Charles University. In her research she focuses on German as an intermediate language between Czech and Spanish, as well as on censorship and didactics of translation and interpreting.



Dr Astrid Winter is a research associate at the Institute of Slavonic Studies at Technische Universität Dresden. Her research focuses on multilingualism and literary language, German-Slavic translation history, intermediality and conceptual literature.

IN COOPERATION WITH



DAAD

→ Interactive elements, videos and games specifically designed for children helped to make complex research comprehensible. This is the display of the Scientific Area Committee 4 Culture & Societal Change.



VON DER WISSEN
 ...gestaltungen des sichtbarsten und wichtigste
 Kommunikationsmedium zwischen den Museen und der
 Gesellschaft. Auch Hochschulen und Forschungsvereinigungen
 haben die Aufgabe, ihre Arbeitsergebnisse einer breiten
 Öffentlichkeit zur Verfügung zu stellen. Das geschieht
 zumeist über Bücher, Publikationen, Handlungsempfehlungen,
 Beratungsgespräche und Tagungen. Aber auch die Forschung
 stellt aus, indem sie zum Beispiel ihre Expertise in die Vor-
 bereitung einer Ausstellung einbringt oder sie zur Grundlage
 eines wissenschaftlichen Rahmenprogramms macht.

// Museums and collections deal with five big tasks in a
 challenging environment: they collect, store, research, exhibit
 and convey all types of knowledge. Exhibitions are the most
 visible and the most important communication medium
 between the museums and society. Universities and research
 institutions also have the task of presenting their work results to
 a broad public. This is mostly done through books, publications,
 recommendations for actions, consultations and conferences.
 Research presents itself as well, by providing expertise for the
 preparation of an exhibition or uses the expertise as a base for
 scientific programmes.

...ing and preserving our cultural heritage is one of
 main tasks of Dresden's culture and science institutions.
 Preventive conservation and the careful restoration of
 purpose of preserving and the careful restoration of
 most modern procedures to find the best way to
 repair it and to avoid damage in the future.
 answers to important questions in the field of
 original or a forgery? Which materials should be
 the production? However, other special
 we preserve historically grown values
 challenges? Handling cultural heritage
 for interdisciplinary research, for boys
 Humanities

...gaben der Museen
 ... zu erheben, zu bewahren, zu erforschen, auszu-
 ... zu präsentieren. Museen sind ein zentraler
 ... der Gesellschaft. Auch Hochschulen und
 ... die Aufgabe, ihre Arbeitsergebnisse einer
 ... Öffentlichkeit zur Verfügung zu stellen. Das
 ... geschieht zumeist über Bücher, Publikationen,
 ... Beratungsgespräche und Tagungen. Aber auch
 ... die Forschung stellt aus, indem sie zum Bei-
 ... spiel ihre Expertise in die Vorbereitung einer
 ... Ausstellung einbringt oder sie zur Grundlage
 ... eines wissenschaftlichen Rahmenprogramms
 ... macht.

...MUSEUMS AND COLLECTIONS DEAL WITH FIVE BIG TASKS
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 ... STORE, RESEARCH, EXHIBIT AND CONVEY ALL
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 ... MOST VISIBLE AND THE MOST IMPORTANT
 ... COMMUNICATION MEDIUM BETWEEN THE
 ... MUSEUMS AND SOCIETY. UNIVERSITIES AND
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 ... DATIONS FOR ACTIONS, CONSULTATIONS AND
 ... CONFERENCES. RESEARCH PRESENTS ITSELF
 ... AS WELL, BY PROVIDING EXPERTISE FOR THE
 ... PREPARATION OF AN EXHIBITION OR USES THE
 ... EXPERTISE AS A BASE FOR SCIENTIFIC PROGRAM-
 ... MES.

...SCHLAGWERK
 ... 1.200 ARTEN MIT ÜBER
 ... 100.000 STÜCKEN. // THE MANUAL
 ... HOUSES MATERIAL FROM OVER 1.200
 ... WITH OVER 26.000 INDIVIDUAL OBJECTS.

Unearthed and Unveiled: New Approaches to Exhibiting the Archaeology of Mines

Many archaeological sites, especially those situated underground or submerged are neglected due to a lack of public awareness. Awareness, however, is crucial for conservation, tourism, and economic development. Projection technologies, such as virtual reality, are useful for exhibiting these hidden sites. In the *VirtualArch*-Project, partners from eight countries are exploring such methods by investigating European sites facing similar challenges. These include UNESCO pile dwellings, settlements, ancient harbours, castles, and mines. In the *ArchaeoMontan*-Project Czech and Saxon archaeologists are exploring the Ore Mountain region – one of the most important medieval mining areas in Europe – in order to gain insights into their respective national histories, including ground-breaking mining technologies. The lecture will be held in both Czech and German.



Jan Mařík, PhD, is the director of the Institute of Archaeology at the Czech Academy of Sciences in Prague. His specialisations include Early Medieval strongholds, archaeological heritage management and geographic information systems in archaeology. Mařík was a member of the scientific committee at the 19th Annual Meeting of the European Association of Archaeologists and has also been a board member of the European Archaeological Council since 2012.



Dr Christiane Hemker has been heading the archaeological mining research programme at the Archaeological Heritage Office Saxony for many years. The research focus of her international projects is on medieval mining in Saxony and Bohemia. She is also Head of the Archaeological Preservation of Monuments in south-west Saxony and is responsible for the archaeological excavations in cities, castles and churches, being conducted in this region.

→ The objects from the silver mines of the Eastern Ore Mountains are one of the highlights of the touring exhibition, due to the excellent state of their preservation.



3 MAY

13:00–15:00

CZECH ACADEMY OF SCIENCES,
NÁRODNÍ 3, ROOM 205

Building a Bridge for Science Dresden–Prague

LECTURE

Deep learning for better microscopy, mobile genetic elements shaping the evolution of genomes: These two cutting-edge scientific topics are being pushed to the limits by young scientists from Dresden and Prague. The goal of the Advanced Research Incubator in Biosciences (ARIB), a joint project of the Max Planck Institute of Molecular Cell Biology and Genetics (MPI-CBG) and the Institute of Molecular Genetics (IMG), is to build a bridge for science between Dresden and Prague. Two short presentations will illustrate how the two cities meet in the area of biomedical research: **Deep Learning – From Mastering the Game of Go to Revolutionising Microscopy** by Florian Jug and **Jumping Genes and Evolutionary Jumps – A Lesson from Mouse Egg Cells** by Petr Svoboda. There will be time after the presentation to have a discussion with the speakers. Join us to find out what the future holds.



Dr Florian Jug has been the group leader at the Center for Systems Biology Dresden (CSBD) since 2017. His research aims at pushing the boundary of what computer vision and machine learning can do for the automated and semi-automated quantification of biological image data.



Prof Petr Svoboda is a senior group leader at the Institute of Molecular Genetics AS CR in Prague. He received his PhD from the University of Pennsylvania where he studied RNA interference in mouse oocytes. He is currently studying post-transcriptional regulations during oocyte-to-zygote transition in mammals with a special focus on RNA silencing mechanisms.

IN COOPERATION WITH



LEN IM
NDEN
S IN
INDNESS

Retina, gehören
gen in den
ndheitsbehörde
it 285 Millionen
onen davon
rben von
stitut für
erforscht an der
genetischen
Augen von
ebaut sind,
imbe? dieselbe
bnisse könnten
spielsweise
apie wird ein
ingesetzt.
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Stammzellen in
ie Aufgabe der

of the most common causes for
industrial countries. According to
WHO) 285 million people have
se 40 million go blind. The most
retinal nerve cells. Using the fruit
entists explore which genetic
hough the eyes of a human and
ly, a mutation of the crumbs1
blindness. The research results
erapies, such as gene and cell
n intact gene is implanted in
is gene takes over the function
nts photoreceptors
to see colours
herapy, h
e then



— BETÄUBUNG DER TAUFLEGEN
// ANAESTHETIZING FRUIT FLIES

Wirden Fliegen für die Tauflegen in diese Kammern, die Fliegen werden
anästhetisiert, um sie für kurze Zeit vom Kopf zu trennen.
// In order to be able to work with the flies, to sort and count them,
they are anesthetized with carbon dioxide for a short period of time.

→ Research in biomedicine and bioengineering in Dresden is internationally leading. The exhibition shows some of the results and invites you to explore it.



— DROSOPHILA MELANOGASTER

Die Tauflegen ist eine Insekten-art der Gattung. Eine der größten
Vorteile: Die Fliegen sind einfach und schnell zu züchten, auch nur
in kleinen Schalen im Labor. // The fruit fly
is the pest of genetics. One of its major advantages: The flies are
easy and quick to breed. They can produce up to 400 new flies in
14 days.



! IM FLIEGENRAUM // IN THE FLY ROOM

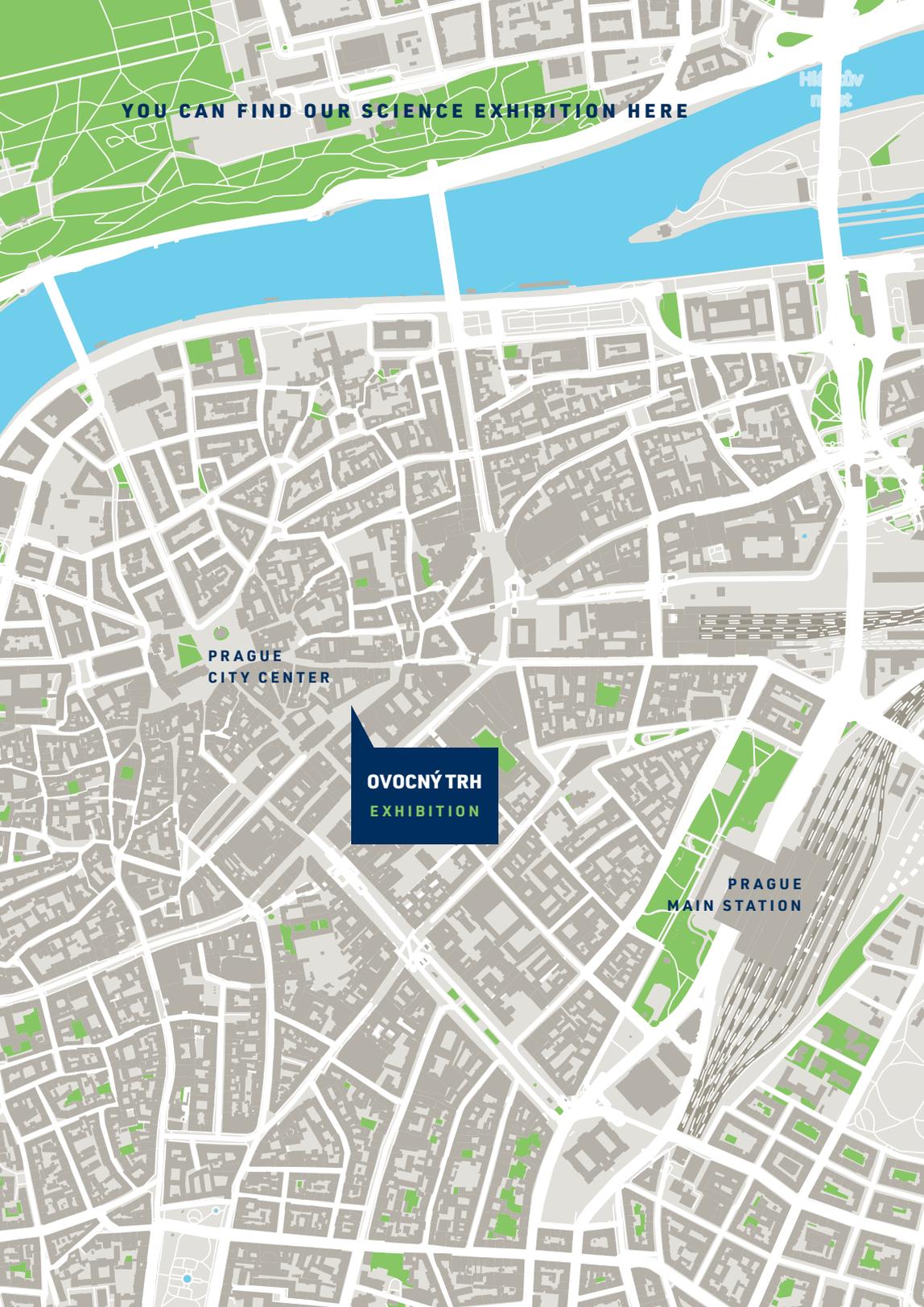
Hier bekommen die Tauflegen frisches Futter. Mehlwürmer werden
kleinisiert und Fliegen gefüttert. Mit einem feinen Sieb werden
abgewaschene Fliegen abgetrennt.
Fresh food, insects are cut into
separate individual flies using

WIE SEHEN AN... TOSA ERK...
O RETINITIS... S SEE?



AVOIDED?

...t flies and humans carry
...nes, the carrier of genes
...s the future, doctors will
...son, which then replace
...way to prevent blindness.



YOU CAN FIND OUR SCIENCE EXHIBITION HERE

**PRAGUE
CITY CENTER**

**OVOCNÝ TRH
EXHIBITION**

**PRAGUE
MAIN STATION**

Contact

PLEASE REGISTER FOR EVENTS AT

→ www.dresden-concept.eventbrite.de

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funded by the Excellence Initiative of the German Federal and State Governments.*

UNDER THE AUSPICES OF

STAATSMINISTERIUM
FÜR WISSENSCHAFT
UND KUNST

