

# NEWS AT BUT

2016/2017



## Solar Eclipse Expedition

A BUT team has succeeded in getting an image of the solar white-light corona



VUTIAM Press  
of Brno University of Technology is  
offering a new Czech translation of  
***Organic Chemistry***  
by John McMurry, edited in  
cooperation with the University  
of Chemistry and Technology  
Prague.

Used by students at many universities  
all over the world, this textbook  
by McMurry, professor at Cornell  
University in New York, is a standard  
guide to the basics of organic  
chemistry.



#### NEWS AT BUT

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NOT FOR SALE!

#### EDITORIAL



Foto Igor Šeif

Dear Readers,

You are holding the first edition of the English magazine News at BUT. This new journal is intended for all international students and employees of Brno University of Technology, as well as for everyone interested in the news from this university.

As is evident from the appearance of the magazine, BUT went through a significant design change last year: the new unified visual style of the university also includes a new logo, which you can find on the front page of the magazine. The magazine News at BUT has been around in the Czech edition for more than 20 years, where there is only a short English summary at the end of each article. But because BUT is a major international university and the largest technical university in the Czech Republic, we have decided to make the first English edition.

In this issue you can read about the most important events of the past academic year 2015/2016, such as the solar eclipse expedition to Indonesia, student achievements in the Brno Ph.D. Talent competition, a new model of the Dragon 6 student formula and information about the Red Dot Design Award for a BUT student.

I hope that News at BUT will give you some interesting information about projects and activities that our students and scientists are working on. If you are interested in current events at BUT, check the Facebook page of Brno University of Technology or the official website of the university: [www.vutbr.cz/en](http://www.vutbr.cz/en).

I wish you pleasant reading,

Radana Kolčavová  
Editor-in-chief

A five-member team from the BUT Faculty of Architecture is the winner of an architectural competition for the use of Berlin University Residences.

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The outcome of cooperation among three Brno institutions is an appliance used by medical specialists to apply a technique of irreversible electroporation at the preclinical stage of research.

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The simultaneous translation of lectures into sign language is becoming more commonplace at BUT also thanks to the new BUT Dictionary of Selected Technical Terms.

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COOPERATION



Photo by Igor Štefr

Memorandum of Cooperation between BUT and a Korean University

Brno University of Technology will cooperate with Chungnam National University in South Korea. On Monday 2<sup>nd</sup> May, BUT rector Petr Štěpánek received a three-person delegation led by rector Deog-Seong Oh. Together they signed a memorandum on reciprocal student mobility. In the future, both parties plan to extend the cooperation to include research.

(red)

PRESENTATION



Photo BUT/FC archive

Molecular Food by BUT Offered at Expo

As part of a presentation of the South Moravian Region and the City of Brno at EXPO 2015 in Milan, BUT was running a research theatre in the Czech Republic pavilion. One of the most appealing performances was 21<sup>st</sup> Century Molecular Food, with the parts played by scientists from the Faculty of Chemistry.

“We designed a few delicious and attractive dishes that could be made on the fly and presented no danger when eaten,” said Tomáš Opravil, the author of the programme. “Being in Milan, spaghetti was of course an obvious option, but this time it was made from strawberry syrup. Strawberries, on the other hand, were prepared from tomato soup with gelatine balls made of balsamic, and there were also mixed drinks based on gelatinized alcohol on the menu,” added Opravil.

The presentation was also an asset in terms of promotion, with its visual style – the BUT chemists wearing red BUT t-shirts and a university poster placed at the pavilion entrance aroused much interest. Designed by Ondřej Chybík and Michal Křištof, graduates of the BUT Faculty of Architecture, the Czech pavilion received a bronze medal for its architecture.

(red)

AWARD



Photo by Igor Štefr

Sci-Trace from CEITEC BUT is the Best Cooperation of the Year

In April, a project to conduct advanced laser-based analyses of solid, liquid, and gas materials received the Best Cooperation of the Year 2016 award. A team at the BUT Central European Institute of Technology (CEITEC), in cooperation with Tescan Brno and the AtomTrace start-up, designed a Sci-Trace device for carrying out element analyses of materials using laser-induced breakdown spectroscopy (LIBS). This unique solution was also rewarded by such institutions as the Association for Foreign Investment (AFI) and the American Chamber of Commerce in the Czech Republic (AmCham).

(red)

# Solar Eclipse Expedition

Months of preparations and then only 3 minutes and 20 seconds – exactly that was the time available to the solar eclipse expedition this year to make a sufficient number of pictures to document the star nearest to our planet. But the weather in equatorial Indonesia was not too friendly to the experts of the Department of Mathematics of the BUT Faculty of Mechanical Engineering – they had clear skies for a mere 40 seconds. Despite that, they managed to capture enough data to visualize the solar corona as seen by the human eye.

Text by Radana Kolčavová  
Photo by Miloslav Druckmüller,  
BUT FME

“When comparing the area close to the solar disk, which is very bright, with regions near the edge of the image, where other stars can also be observed, we get a contrast

ration of more than 1 to 1,000,000. Here, classic digital photography has absolutely no chance to succeed. Therefore, many pictures of the same object have to be taken, each

with a different exposure. After that, the resulting images must be overlaid with very high precision. Then, mathematics comes into play to create an image with a linear dependence of



pixel values of brightness.” This was how the resulting image of the solar corona was described by Miloslav Druckmüller, the leader of the expedition, who, for the first time, was not physically present but coordinating the observation sites remotely from Brno.

The members of the Czech expedition set up as many as four sites to increase the chances for acquiring the best data. But the atmosphere was very hectic on each site. “Immediately before the eclipse, about two hundred people gathered around us: school children with teachers, people in traditional costumes with drums wishing to engage us in their ceremony. They were moving very close, which presented a danger of the observation devices installed outside the tent being trampled down,” stated Jana Hoderová, who was also a member of the previous solar eclipse expedition. Tourists are often a threat for research.



equator, which is a very cloudy region with high humidity, we didn't know until the very last

in arranging a daring quick transport of all the observation devices to a beach and, subsequently, moving them back swiftly. Thanks to his previous experience, everything was set up and in focus quickly enough to get a picture through light cloud cover of what is called solar totality,” commented Hoderová on the success of another member of the Czech expedition.

When comparing the area close to the solar disk, which is very bright, with regions near the edge of the image, where other stars can also be observed, we get a contrast ration of more than 1 to 1,000,000. Here, classic digital photography has absolutely no chance to succeed.

“During the eclipse itself, these amateur eclipse-chasers will take pictures with flash or open Champagne bottles,” said Druckmüller.

moment how all this was going to end. This year's expedition certainly got the adrenalin going,” said Druckmüller.

All the members of this Indonesia expedition, which for his team is the ninth in a row, sensed that this time they might be in for a real crisis. “As Indonesia is almost on the

“The weather was very bad with rain and a thick cloud cover all over the sky. Fortunately, immediately before the eclipse, our colleague Petr Horálek from the Czech Astronomic Society succeeded

An important expedition member was also Pavel Štarha, who manages the software controlling the cameras and thermostats. “Provided mostly by the Institute for Astronomy of the University of Hawaii, the hardware is controlled by Czech software. We then also process the data acquired,” explained Druckmüller about

the role of Štarha. Working on it for eight years, Druckmüller is the author of this special software.

At first, the expedition members were not sure if they would have sufficient data for all the calculations necessary. "Despite the initial fear about a lack of data, we finally managed to get an image of the white corona, which shows the distribution of free electrons. Perhaps we also have sufficient information for the spectral lines of ionized iron," said Druckmüller, who is still working on analysing all the information obtained. From each observation site, the researchers can get up to 60 GB of data. While people from the Faculty of Mechanical Engineering help devise the algorithms for their processing (the mathematical part), the Americans focus

more on the physics of plasma. In addition to the University

To put it simply, the resulting image has two layers: one is a perfect reflection of the physical measurements, with another on top of it showing all the coronary structures. All the properties of human vision are taken into consideration, too.

of Hawaii, the expedition also received support from Peter Aniol, a German enthusiast and renowned expert in optics.

"To put it simply, the resulting image has two layers: one is a perfect reflection of the physical measurements, with another on top of it showing all the coronary structures. All the properties of human vision are taken into consideration, too. This is the visualisation of a picture with a very wide dynamic range," stated Druckmüller.

The series of solar eclipse expeditions is coming to

a milestone: "The Sun changes at an unbelievable rate, with the corona looking completely different during each eclipse. With the periodicity of solar activity being about 11 years, we have now covered and described almost the complete solar cycle," said Brno mathematician Druckmüller, whose pictures of the solar corona have also been published on the front page of Nature and in Editor's Choice of Science.

In the ideal case, scientists would need much more data to be able to capture the dynamic process of changes in the Sun, but at least about once a year an eclipse can give them a scant chance of observation. Even now the representatives of the upcoming tenth Shadow Tracking Expedition are preparing for the next one. "Next year, the eclipse path will pass across the United States. Although observed only a few minutes at each site, the shadow will stay on US territory for a whole ninety minutes. Therefore, the University of Hawaii is planning for a record ten observation sites, which is a very ambitious project. Since much more staff will be needed, the expedition is likely to be bigger than this year's," concluded Druckmüller, outlining his future plans. ■



## SUCCESS

# Success of BUT Mechanical Engineers at EBEC 2016

Text by Filip Liška, BUT FME, and Jana Novotná  
Photo BEST Brno archive

A team from the BUT Faculty of Mechanical Engineering won the central round of the European BEST Engineering Competition (EBEC). In the Team Design category, at the end of April, they beat the winners of the local rounds at six technical universities from the Czech Republic, Hungary, and Slovakia. Jaroslav List, David Hruboš, Miroslav Rebej, Jan Fabig, all members of the winning crew that advanced to Belgrade, Serbia, answered our questions about their first impressions. This interview was taken immediately after the competition EBEC Central. In the summer of 2016 this Team 42 also won the second place at EBEC Final in Belgrade, Serbia.



**This year, the EBEC 24 idea has been gaining ground in Europe, which means round-the-clock work without a break. Did you know that one of the venues would also be Brno? Did you get any training?**  
Miroslav: Well, we were informed about the round-the-clock business, so we had some beers the night before to get some sound sleep. Then during the day, others lived on Redbull and coffee.

**Could you give us a short account of your task? What was the most difficult part?**  
David: We were given a couple of cardboard, wooden sticks and some glue, and told to build a rollercoaster for a table-tennis ball filled with water. Perhaps the most difficult part of this was to figure out what we were actually up to, because not many of us had built a rollercoaster before. Trying to build something

just to find after four hours that it barely stands a chance of working really brings you down, such as when we built too large a loop and had to raise the railway to the ceiling to give the ball some speed. But the most difficult task was to design a dependable lift and its controls, as you can hardly rely on much accuracy when working with cardboard. In the end, we managed to make it just with a simple gear.



**How did you plan the work and how did things go?**

**Jan:** Given more time, the rollercoaster would have been longer, more carefully worked out and maybe nicer looking. I just want to say that even in 8 hours we would have built a rollercoaster,

but it would have been a bit more modest. Setting up a rough schedule at the start, we immediately threw ourselves into work that lasted until 6 am. The last two hours, we were just decorating the railways to get some points for the look.

**If you could go back in time, what would you do differently?**

**Jaroslav:** To begin with, we would certainly economise on glue as much as possible, as it was very scarce. In the last few hours, we had to just join things by simply hooking them to each

other – it was a sheer will-power that held the structure together.

**Jan:** Well, now that I think about it, I feel proud of our team and its cooperation. I wouldn't have changed anything!

**Although the task specification was not intended for mechanical engineers, you managed to consternate the jury. Could you use something you learnt at school, or were you more guided by critical and creative thinking?**

**Jaroslav:** Our technical education did of course help us think a bit differently from other teams. But, most of all, it was all about imagination, creativity and cooperation. What was important from the very beginning was that we were set on building a rollercoaster according to the given theme – as a time machine.

**You had already seen quite a lot of different task specifications before this competition. Did the EBEC tasks still have something new in store for you?**

**Jan:** Yes, they certainly did. This must be credited to the organizers, who always check each task for feasibility before each competition.

**How will you be practising for the final round?**

Our technical education did of course help us think a bit differently from other teams. But, most of all, it was all about imagination, creativity and cooperation.

**David:** I think that our priority now is finishing the semester. Since we are now 3<sup>rd</sup>-year students, we will start looking forward to and thinking about Belgrade when we have graduated.

**Jaroslav:** We will try to get together using the "experience

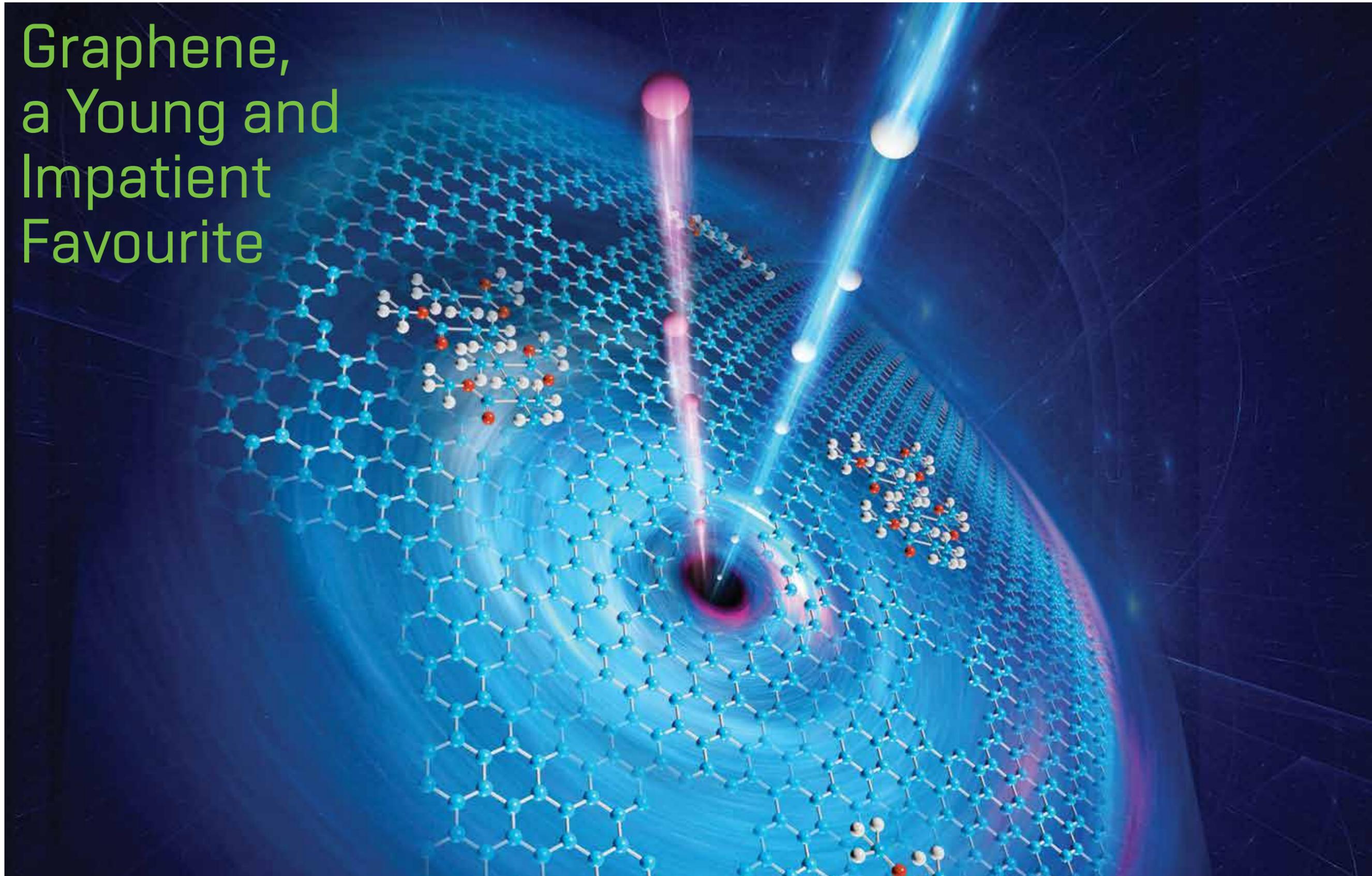
vouchers" we won in the previous rounds for team building.

That the team was well-tuned has been attested by the silver medal won by the Team 42 of the BUT Faculty of Mechanical Engineering at the European BEST Engineering Competition in the team design category. Held in Beograd, Serbia, the final was attended by 120 competitors from all over Europe.

"There were 14 teams in the finals each working in their own room so we had hardly any idea of how we were doing compared with the others," recalled Jan Fabig, a member of the Brno team. Luckily, our fears of being worse than other competitors proved to be unfounded after the

BUT team was the only one to completely fulfil the first task. Working on the second task, the other teams finally got on the right track leaving us third. In the final scores, we came in second with the victor's palm carried off by the team of Kaunas University of Technology from Lithuania. ■

# Graphene, a Young and Impatient Favourite



Though looking like a perfect honey-comb, it may be the strongest material in the world. A material of the future for microchips, sensors, solar cells and active membranes, graphene is the most recently described form of carbon; it is very scarce in nature and high quality production is still a problem. As such, the reality of world production still lags behind the theoretical expectations and requirements of industries.

Text by Jana Šilarová, CEITEC BUT  
Photo by Jan Novotný, CEITEC BUT

Lead by Tomáš Šikola, a group of researchers at CEITEC BUT at work on the preparation and characterization of nanostructures are now using an outstanding method that is helping them find a most accurate description of graphene. Their findings were published in the journal ACS Langmuir and the quality of their paper is evidenced by the American Chemistry Society (ACS), including it in its Editors' Choice, intended for free dissemination. While this success was achieved by the Brno group with an appliance made by

them, from now on, they may continue their research using the unique Qtac 100 spectrometer, newly installed at the CEITEC BUT laboratories.

"In nanotechnology theory, the concept of 'surface' acquires key importance. Often, semiconductor and nanotechnologies are used to prepare surfaces with appearances that are not precisely known. Graphene and its actual implementation is much like that. Using the Low

A material of the future, graphene is the most recently described form of carbon; it is very scarce in nature and high quality production is still a problem.

Energy Ion Scattering (LEIS) method, we found a way of analysing graphene, which has the unique property of being composed of a single layer of atoms, to determine the homogeneity and contamination of its layer," explained Stanislav Průša, the author of the paper. As it is, using the same physical principles as the well-known experiments conducted by Ernest Rutherford leading to the discovery of the atom nucleus, the method of element analysis used is by no means new. "The same laws also govern carom billiards. The collisions of projectiles with the atoms of the examined samples are so fast and violent that the bonds with the neighbouring atoms fail to respond to the collisions in time. While Rutherford had to use radioactive emitters, we have an ion cannon that can produce exactly the particles (projectiles) needed,"

continued Průša, explaining the principle of an analysis that provides the element spectrum of a sample.

Compared to other methods, LEIS has extreme surface sensitivity capable of analysing only the sample's topmost layer while leaving the others undamaged, which makes it an auspicious instrument.

The researchers will also use the Qtac 100 spectrometer to further optimize the technology

of CVD graphene growth, as well as in other applications requiring an analysis that is sensitive to the single topmost atom layer of the examined system. The device is only the ninth of its kind in the world. It is, however, the first component of a sophisticated system for nano-system deposition and analysis. "Using it, we will be able to see immediately whether the step we have made in order to analyse a nano-system was really necessary or whether it was an error," pointed out Průša. The sophisticated device, including the Qtac 100, will be installed in the CEITEC shared laboratories, which are also available to non-CEITEC researchers. ■

## COOPERATION

# New Technologies from BUT Heading to the Market

**Recently, the BUT Technology Transfer Office has launched further commercially attractive technologies developed at our university. After the testing phase, contacts were established with potential industrial partners. Receiving intellectual property protection, the technologies were attested to be unique.**

Text by BUT TTO team  
Photo BUT TTO archive

This was all made possible by the projects Security and Defence, Power Resources and Molecular Biotechnologies, financed from the European Regional Development Fund and from the Czech government budget through the Research and Development for Innovations Operative Programme. Several companies of those offering the make use of the new findings made at BUT have already shown interest in the following technologies.

Winning a medal at last year's Civil Engineering Fair and praised highly by experts is the smart wall, the name given to an assembly of heat storage modules with a capillary tube system to stabilize the microclimate of constructions with light wrapping structures. "Companies delivering system buildings were interested in using this system, as well as exhibition halls and museums," said Milan Ostrý of the Institute of Building Structures of the BUT Faculty of Civil Engineering, the inventor of the wall. The technology can efficiently stabilize the thermal microclimate in buildings at low costs. The

system is designed for people to feel comfortable in rooms, providing passive cooling in summer and low-temperature heating in winter.

Another project with commercial potential is the combined oil-gas burner designed for burning gas and liquid non-standardized fuels, as well as other specific kinds of waste. These have been very in demand recently due to the rising prices of conventional fuels. "The burner was tested with good results when burning used deep-fry oil, which is why it is regarded as a possible power resource for the production lines of PHA bioplastic, which is made of used deep-fry oil under the trademark HYDAL," said Dagmar Vávrová, head of the BUT Technology Transfer Office.

The uniqueness of the fluorescence microscope with high definition for molecular biology and medicine consists in the fact that it can create an optical section of the observed object, enabling a reconstruction of the spatial arrangement of particles emitting radiation within it. Therefore, it may be attractive for some leading manufacturers of microscopes.

Thanks to its properties, the microscope makes it possible

to, for instance, observe what is happening in living cells. The device can be used in cell and molecular biology, as well as in experimental and clinical medicine, pharmacy, toxicology, agriculture and the food industry.

The nano-potentiostat as a progressive biotechnology for medicine detects the presence of and measures the quantity of substances in liquids of biological and toxic importance, offering a wide

spectrum of applications. Apart from medicine, it can be used in agriculture, industry, and virtually by anybody interested in the chemical and biochemical analyses of liquids. Its biggest advantage is easy transport and operation so that liquids can be tested on-site.

As all the above project technologies are heading towards future, we hope that they will be successful on the domestic and international markets. ■

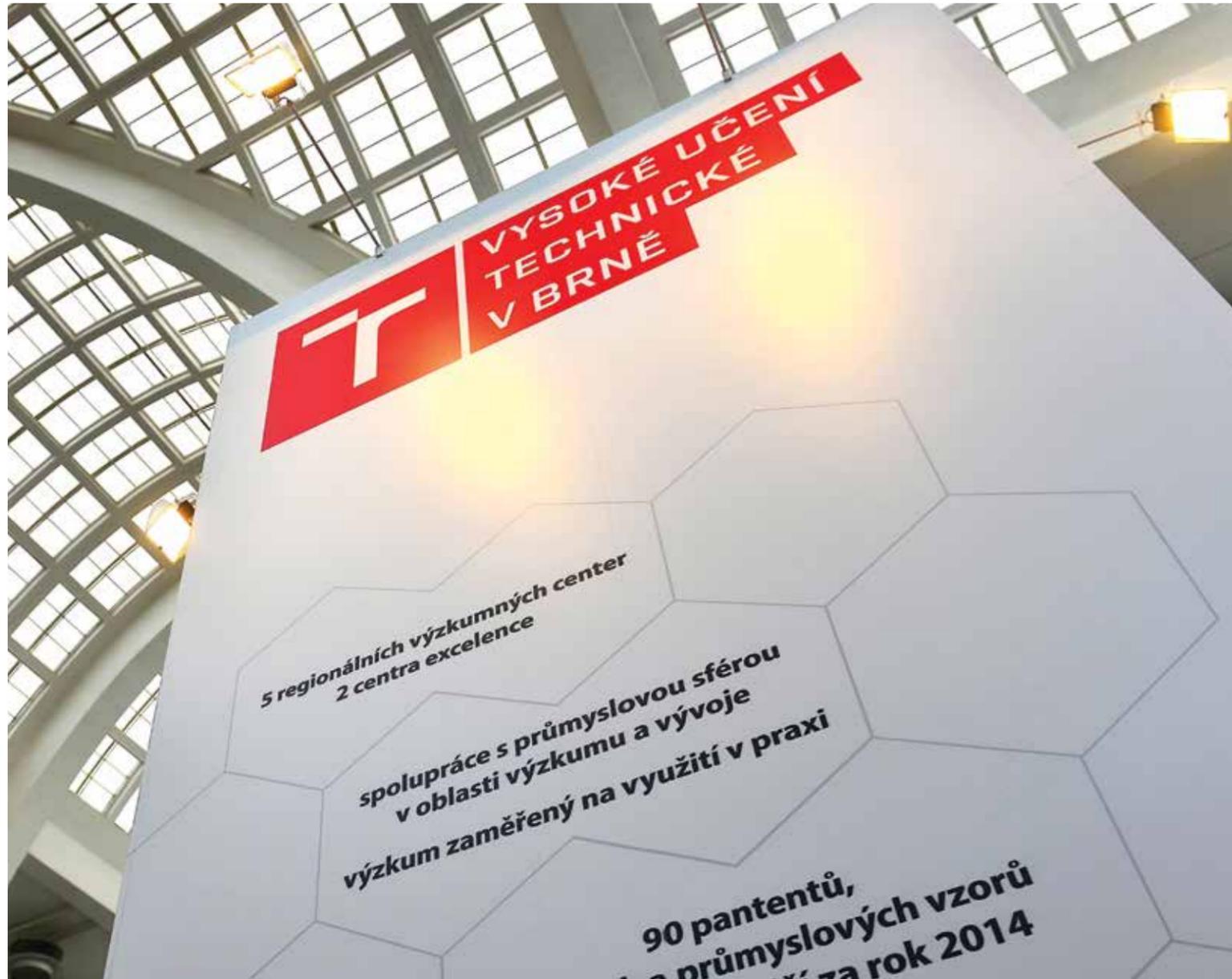


The uniqueness of the fluorescence microscope

# New BUT Visual Style Scores Some Successes

Text by Radana Kolčavová  
and Pavla Ondrušková  
Photo by Igor Šefr

After almost twenty years, BUT has changed its visual identity. Its faculties, institutes, and research centres now have an umbrella logo with a distinctive letter T. A panel of experts chose a symbol that has the capacity to unite while emphasizing the uniqueness of each university constituent part. The BUT promotion campaign for the new logo has met with success in the media and at other universities. It is mostly praised for its lucidity, modern look, and systemic modularity.



The thin lines of the preceding logo were replaced by a strong letter T that makes reference to the word technology. Launched on 21<sup>st</sup> October 2015, the BUT campaign for the new unified visual style was seen by over 150,000 users on social networks in the first week alone. On Facebook, the promotion video had almost 35,000 views after



the first week. The change of visual identity has been reported by such renowned media as Design portal, MediaGuru, Marketing & Media, and Marketing Journal.

“Due to its delicate lines, the previous visual style was often difficult to reproduce, especially on small surfaces. The logo itself was indistinctive and easy to overlook,” commented Vice-rector for Marketing and External Relations Irena Armutidisová on the previous symbol. The distinctive red-white colour combination refers to the traditional Brno colours while distinguishing BUT from its rival universities; the Czech Technical University and Masaryk University both present themselves in blue.

“As work on the new graphic style was initiated already when the previous Rector Rais was in office, the present university management just finished the commenced task. If not anything else, the present style should be more transparent for the new media,” explained Rector Petr Štěpánek. According to the winning design by the ReDesign graphic studio, the letter T presents the detail of a lintel. Others see in it a division of a grid graphic. “Today, designs of all kinds are becoming simpler, so why

should BUT lag behind?” asked Ivo Ondráček, a mechanical-engineering student, on Facebook. Except for a few reactions by

the new logo, it also uses a unified font (Vafle) and brings a new modular system combining the name of the



people who preferred the old BUT logo of 1996, most of the students are satisfied with the new visual style, praising its distinction. “I like to study at a university with the best logo in Brno,” said Miroslav Molinek, an electrical-engineering student. What the students like most about the logo is its simple look and the way the red T can be combined with the colour of each BUT faculty. Chosen by a jury of graphic designers and typographers, the new visual style was designed by Klára Kvízová and Petr Krejzek. Apart from

university with that of each faculty. “We would be glad if the new logo was one of the reasons for BUT to be viewed as a strong, stable, and modern institution, giving birth to a wealth of interesting projects, patents, and discoveries that deservedly attract attention at home and abroad,” added Armutidisová. ■

# Electroporator Helps Surgeons

The outcome of cooperation among three Brno institutions is an appliance used by medical specialists to apply a technique of irreversible electroporation at the preclinical stage of research. This is of great help as a device designed for this kind of treatment is not regularly available to many specialists in the Czech Republic. Moreover, designed at the Faculty of Electrical Engineering and Communication, the power of the new appliance is up to three times as powerful as other such devices.

Text by Radana Kolčarová  
Photo by Igor Šefr

What exactly is irreversible electroporation? Electrodes are inserted into a body affected by a malignant tumour. After the initial setting phase, a series of 1500 to 3000 volt pulses is sent to the area at one-second intervals, with a single pulse lasting several tenths of a microsecond. As a result of the high voltage action, the cell membranes are perforated and small pores appear (giving the technique its name). The cells damaged by this process eventually die.

Until the present, the only device used for this technique

in the Czech Republic has been the NanoKnife (made by AngioDynamics), which has had to be shared by all clinics. Thus, it is practically impossible for many specialists to use this instrument, with treatment or research using it costing several millions of CZK. This was one of the reasons for surgeons from the The University Hospital Brno to design and build their own system to be used for preclinical experiments with easily adjustable parameters (voltage, impulse length and count) and active electrodes that can be switched.

“Our next target is to modify the device for large-scale electroporation. In such a case, electrodes would not be inserted into the organ but rather take the form of a large conductive lattice made of carbon, for example. This would make it possible to electroporate simultaneously over the whole organ. Therefore, our device would be three times as powerful as other similar systems,” said Dalibor Červinka from the Department of Power Electrical and Electronic Engineering. The system developed at the BUT Faculty of Electrical Engineering and Communication can produce a current of up to 100 A and 5 kV. In medicine, a much wider spectrum of applications can be expected.

“The objective was for as many teams engaged in preclinical studies as possible to obtain this device. It is not our ambition to manufacture medical devices. This prototype, however, in offering a wide setting variability is also suitable for demanding experiments

As a result of the high voltage action, the cell membranes are perforated and small pores appear – giving the technique its name. The cells damaged by this process eventually die.

on living organisms,” added Červinka. He indicated that people from ICRC were also interested in the instrument because it has been shown that, in addition to destroying tumour cells, it can also loosen urinary tracts, and could have applications in cardiology.

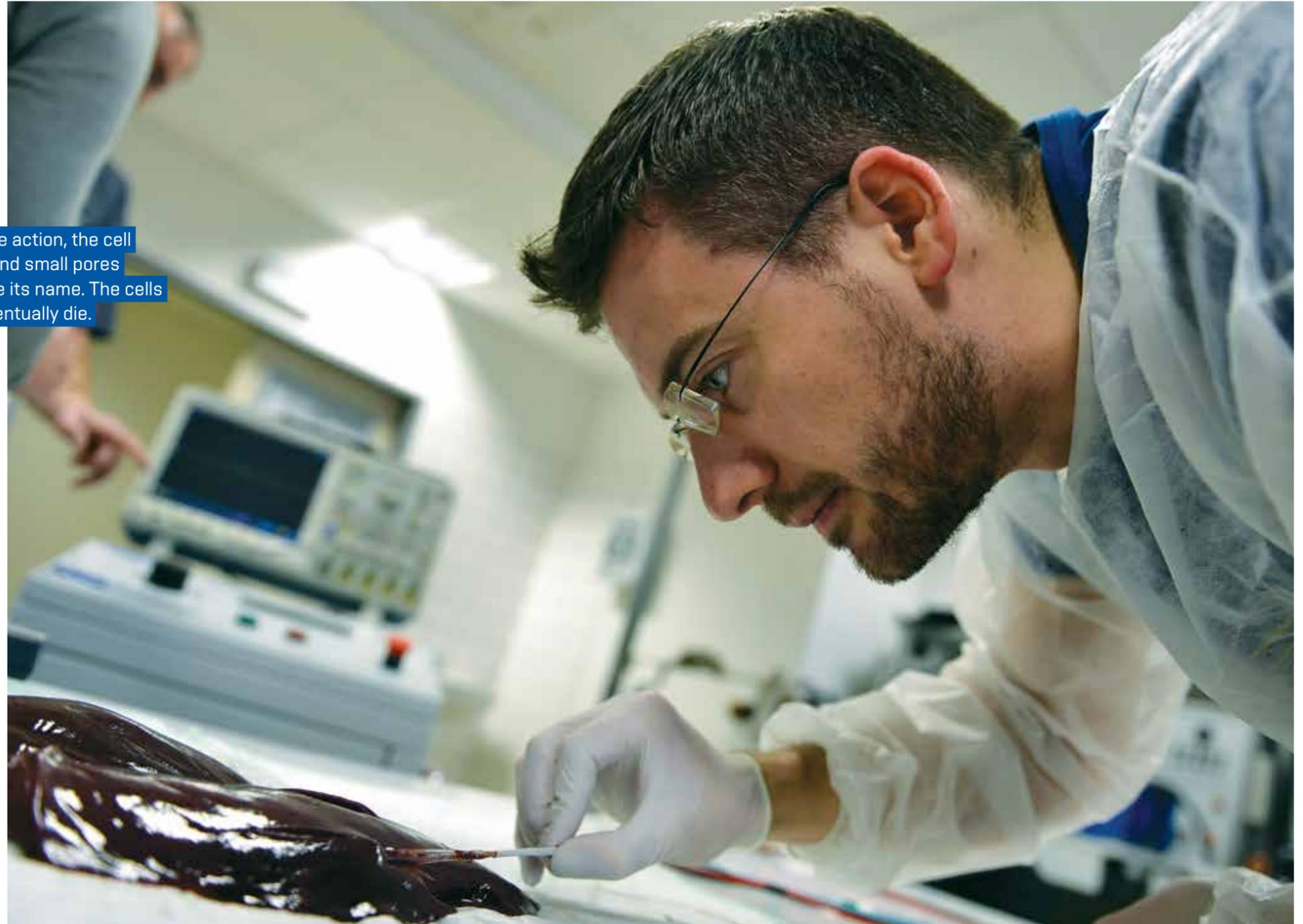
The contractor of the project was the University Hospital Brno. “The idea of developing an electroporator was born in 2014, when we used a start-up grant to order the production of a prototype of an electroporation device from our colleagues at the BUT Faculty of Electrical Engineering and Communication,” explained Tomáš Andrašina from the Radiology Clinic. He is now negotiating further cooperation

with representatives of Hadassah Hebrew University Medical Center in Israel and Beth Israel Deaconess Medical Center in Boston, USA.

The advantage of the Brno system is that it is versatile. “With the generator, the high-voltage pulses can be delivered through various applicators, such as the balloon electroporation catheter

currently being researched by us, or other needle or catheter applicators that we are developing in cooperation with ICRC,” said Andrašina, hoping that a device can be designed in the future that

would eliminate the need for total anaesthesia during surgery. “Research on such techniques is unique even on an international scale,” added Andrašina. ■



# Payment card misuse shown at Excel@FIT conference

Imagine a system that can simulate a hacker-attack on a contactless payment card, a desktop golf simulator, or a program detecting emotions in a phone call. These are just a few of the student projects presented at the second Excel@FIT IT conference in early May at Faculty of Information Technology.

Text by Radana Kolčarová  
Photo by Igor Šefr

An interesting project was presented by Petr Holubec, a master's student, to name just one. "This system demonstrates the ease with which an NFC relay attack can be made on a contactless payment card. It includes an Android mobile application and a server part implementing the communication," said Holubec describing his student project. Even if only 500 CZK can be paid out through a card without entering the PIN code, his system demonstrates that stealing the payment data is very easy. "A typical misuse might consist in moving a phone close to the victim's purse or bag in a bus, while another attacker uses a selected card to pay for goods. Via mobile devices controlled by the attacker, the terminal can communicate with

the payment card at a long distance on the web," said the FIT student.

"Security, not just the cyber aspect, is among our faculty's priorities. We also deal with such things as the secure operation and reliability of computer systems, surveillance, including videos from city security cameras, and analyses of audio recordings," explained the Dean of the Faculty of Information Technology Pavel Zemčík.

Those interested in information technology could also inspect a tool for evaluating Work&Travel programs, or a system that can pre-process huge numbers of electronic documents. IT might also be used to easily find a package leaflet for medicine and its side effects or active ingredients.

An expert panel judged 57 submitted student projects. "When judging a project, we had to



estimate its start-up potential or find out whether it was, for example, an open-source program. The conference should help students who have created an interesting project to present their results to experts and the general public," explained Vítězslav Beran, one of the organizers. That the interest of FIT students is wide can be seen by the subject range of the projects submitted, including artificial intelligence, computer networks, robotics, image and audio processing, and cybersecurity. According to enquiries, graduates from the Faculty of

Information Technology have the best chances of finding a job. Ninety-four percent of such students will find one within three months of graduation. After one year, 99% of IT graduates will be employed. One of the reasons is that in Brno, sometimes dubbed the Czech Silicon Valley, there are hundreds of openings in the IT area. "A new international company may spring up in the region from time to time offering plenty of jobs. It does not necessarily mean that only IT jobs are in demand. All our students have a fair chance of getting a job quickly,"

pointed out Dean Zemčík. That is why Excel@FIT was also attended by representatives from industrial partners, who were given an opportunity in a Think Talk programme to discuss an ideal graduate as viewed by the company. "One of the ideas was for students to get an overall picture of the Brno-and-surroundings-based IT companies. Even big international companies prefer setting up their development centres in Brno, as they are attracted by the large number of experts," said Beran, sizing up the potential of the city. ■



# TU Brno Racing Introduced the new Dragon 6

Text by Radana Kolčavová  
Photo by Ondřej Tichý

“The major target for this season was reducing and centralizing the weight to lower its centre of gravity. All the technical sections have seen major changes, too. A new arrangement of the induction and exhaust systems led to the design of a special turbocharger sponsored by Honeywell,” said designer Gabriel Stariak about

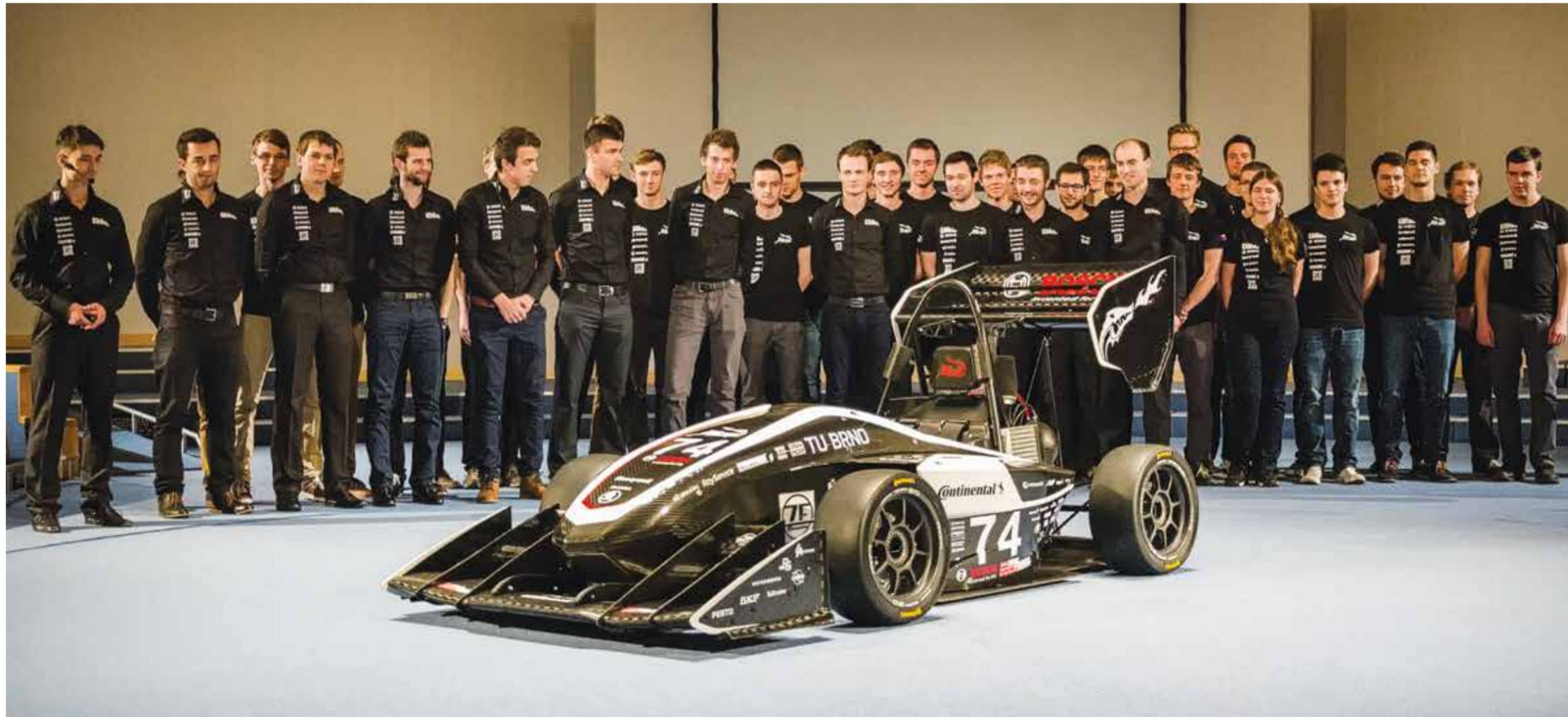
Brno Exhibition Centre in front of representatives of BUT, team partners and some leading figures of motor sports.

The preparations of the racing car began last autumn by finishing the project plans and files. By mid-December, the actual manufacture could start. “Using high-resistance

reliability of the parts. Where the conventional machining methods fail, rapid prototyping or 3D printing from metal and plastic materials can be used

prestigious race of this season will no doubt be the Hockenheimring. Although TU Brno Racing finishes the season in mid-August, its plans

It can accelerate from zero to 63 mph in less than 3.6 seconds. On top of this, a few seconds later, it can be held on the ceiling of a tunnel momentarily by the power produced by the car's aerodynamic elements.



A new model of the student Formula Dragon 6 is the lightest racing car of the TU Brno Racing team. Dozens of design improvements have helped reduce its weight. Now it can accelerate from zero to 63 mph in less than 3.6 seconds. On top of this, a few seconds later, it can be held on the ceiling of a tunnel momentarily by the power produced by the car's aerodynamic elements.

the properties of the single-seater. The TU Brno Racing student team presented the Dragon 6 in mid-April at the

aluminium-titanium alloys and hybrid materials makes it possible to significantly reduce the weight while maintaining the

instead. Using this technology, we saved some time in the manufacture of part replacements so that we could install them into the frame even before the final machined parts came,” explained Tomáš Kolečář, the leader of the TU Brno Racing team.

Even the best racing car, however, is driven by a human. “The drivers of the Formula Student are of key importance for us. Only students of the university sponsoring the team can drive. Therefore, we started recruitment among BUT students early this year. Only five candidates remained after interviews, go-karting and simulator tests. Now the BUT Centre of Sports Activities provides the drivers with fitness training consisting of coaching and continual physical condition testing to live up to the requirements of the racing,” said Kolečář.

Dragon 6 will first show its performance at an unofficial race, ZF Kemp at Friedrichshafen. Then, the team will travel to Italy to defend its second place of last year, continuing to the Most racing circuit in Győr, Hungary to participate in the Formula Student Czech Republic race. But the most

for the next year are already clear: “In the long run, we plan to build a monocoque from carbon fibres with carbon wheels. We would also like to shift our focus on the car's aerodynamics,” said Stariak, outlining the future plans.

**TU Brno Racing** is a student team that regularly participates in the Formula Student race, which is an offshoot of the original American Formula SAE race started in 1981. The process that students from several BUT faculties go through includes the design, manufacture and testing of a racing car, as well as cost analysis, marketing plan preparation and, last but not least, the racing itself. In addition to reliability, manoeuvrability, performance and safety, the jury at races also rates a car's look and price. Over 520 university teams from all over the world participate in the Formula Student project, including five from the Czech Republic. Over the five years of its existence at BUT, TU Brno Racing has advanced to among the fifty best university teams.

For more information, visit <http://www.tubrnoracing.cz/en> or <https://www.facebook.com/tubrnoracing>. ■

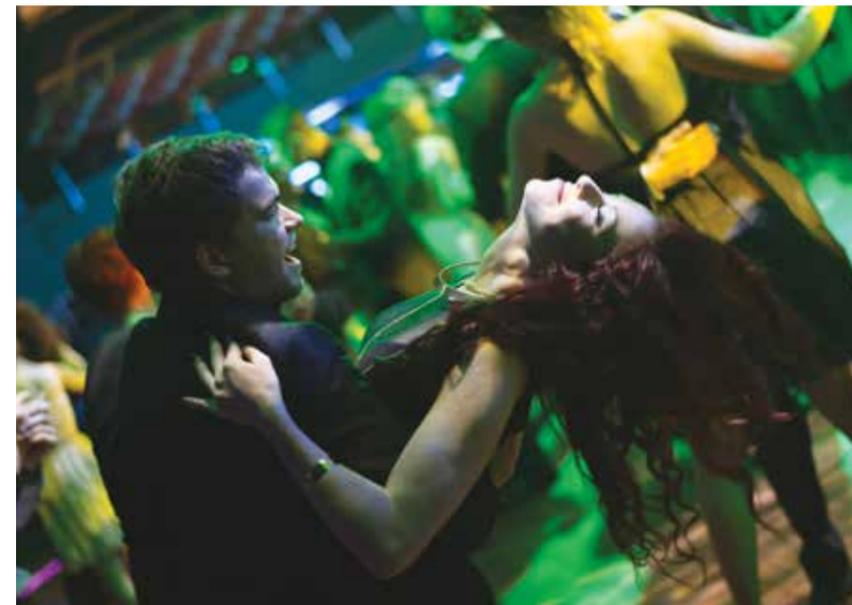


BUT Ball is living!



Thanks to its students, BUT has its tradition of university ball back again. After some break of several years, a Christmas ball was held for BUT students and staff in the Bobbycentrum hall on 3<sup>rd</sup> December 2015. This can be credited to a group of students from the academic senates and student organizations, who, spurred by the positive response to this extraordinary evening, started to plan for another ball next year right away.

Text by Jana Novotná  
Photo by Igor Šefr



# Chemistry Day 2016

To prove that studying chemistry is reasonable and that chemical industries have a wide spectrum of jobs in store is the ambition of the Chemistry Day held annually in March by the BUT Faculty of Chemistry as a part of Open Days. Every year, it attracts mostly secondary students, as well as members of the general public.

Text by Hana Alexová, BUT FC  
Photo archive of the Centre of Materials Research, BUT FC



The novelty of this year's Day held on 10<sup>th</sup> March was that the programme was divided into sections whereby each visitor could choose a subject of his or her own interest. One of the blockbusters was molecular gastronomy, with which BUT scientists "set the world on fire" at Expo 2015 in Milan, Italy. Offering food samples that they made at a brand new stall, they caused a congestion of visitors on the ground floor of the building. The stall was decorated with impressive large-format photographs made at the Faculty of Chemistry using a unique correlation microscopy technique.

A presentation of electron microscopy offered attractive pictures of magnified body parts of houseflies, ladybirds, darkling beetles, ants, and fruit flies, as well as those of human hair and diatomaceous earth. Taken by an electron microscope, each picture was complemented by an exact, even if humorously exaggerated, legend. As miniaturization is used in many fields of science today, the electron microscope is an indispensable

instrument, displaying the details of any material and meeting the requirements of many industries in the Czech Republic and abroad. The Centre of Materials Research operates two scanning electron microscopes, one of them having a resolution of down to 0.8 nm and magnification of up to about 1,000,000 $\times$ , and the other offering a resolution of down to 3 nm and magnification of up to 1,000,000 $\times$ ; when a sample is being warmed or cooled, it can operate under a pressure of up to 3,000 Pa.

Visitors touring an exhibition on carbon capture and storage learned about the carbon cycle in nature and other ways of influencing global climate changes or related social issues. They could also inspect a part of an industrial furnace built, among other things, from insulating fireproof materials developed by the Faculty of Chemistry in cooperation with P-D Refractories CZ. These refractory materials are lighter than water, having resistance up to temperatures of 1,500 $^{\circ}$ C. As part of a tradition, there

were spectacular as well as instructive experiments demonstrated as observed in both laboratories and day-to-day life.

Those interested in one of the popular science presentations could choose from the following topics: Magnesium: The Light of the Past and Future, accompanied by a competition to win a magnesium-driven toy-car or a magnesium flint; or The Principles of Fluorescence for Beginners and up to Nobel-prize Winners. Visits were also available to laboratories investigating metals and corrosion, and silicates, as well as those for analytic chemistry, food technology, and fluorescence.

Secondary-school students considering studying at the Faculty of Chemistry were offered sample curricula and course lists, the specialization of each study field, and opportunities to conduct research at the faculty. Job opportunities for future graduates were explained by representatives from companies of the chemical industry and related fields, who talked to each interested study candidate, giving away such secrets as which chemists are in demand at PENAM, Teva Czech Industries, Fosfa, Molitan and others. ■

# Red Dot Design for a BUT student

Text by Jana Novotná  
Photo by Matúš Chlpok archive



A successful Bachelor's degree project and the winning project in the Red Dot Design Award two years later is the true story of Matúš Chlpok, a fifth-year student of industrial design at the BUT Faculty of Mechanical Engineering. However, his design of binoculars had already reaped success on an international scale before when it was included in the production plan of a starting US company.



**reddot award 2016**  
winner

"I hesitated between mechanical engineering and architecture. I've attended graphics courses since I was young, but in the end mechanical engineering grabbed me more. In the second semester, I decided for design," explained Chlpok, from Bojnica, Slovakia, his beginnings at BUT. He chose the design of binoculars as the theme of his Bachelor's degree project. He didn't know much about what to do at first, but then he hit on an idea that paved the way to success. "When thinking about the

problem definition, I concentrated on the way people hold binoculars and suddenly I saw human hands in it." This basic premise then gave birth to a new design that copies the shape of human fingers and, with its rough surface, allows for a tighter grip.

Supervised by Miroslav Zvonek, a teacher from the Faculty of Mechanical Engineering, the design was implemented under the expert guidance of Jana Vaňková of the Meopta Company. Still in the form of a white model made of synthetic wood, the binoculars were presented at a university exhibition of Bachelor's projects in 2014. Immediately afterwards, having heard that Athlon Optics, a new US company, was seeking designs for its products, Matúš registered his design. He built on the motif of his Bachelor's degree project and, because the Americans liked it and because it was created under professional supervision, it was accepted for implementation.

Receiving the name of Athlon Midas, the final product was the result of a rather complicated chain of amendments. Seeing the primary production version, the author of the design almost failed to recognise his own work: "Since it had all sort of disintegrated, I had to reformulate the original lines of my own design."

Nevertheless, the product was again assigned for production after four months, along with other products of a unified line all being Chlpok's modifications of the existing models.

This brought the cooperation to an end with the young designer becoming confident of being able to succeed on an international market. One of the factors that contributed to his being an efficient manager, in addition to being an inventive technician, was his Erasmus stay in Salzburg. "The teaching there accentuates management and marketing, maybe too much for my taste, but for me it was definitely a help," stated the young designer.

Encouraged by the success of his binoculars late last year, he signed up for the Red Dot Award international competition in the Young

Professionals Day category intended for young designers, who are waived the application fee provided that they are among the fifty anonymously

When thinking about the problem definition, I concentrated on the way people hold binoculars and suddenly I saw human hands in it, said the young designer.

selected applicants. As Chlpok's design was among the selected, he was subjected to the strict judging procedure of an expert panel, finally winning the Product Design category.

"I was very pleased to hear about Matúš winning such a prestigious award for the colours of our field," commented Miroslav Zvonek on his

student's success. "Because he has not forgotten his teachers or university. May his diligence and modesty guide him through his professional career," proclaimed his professor, pointing out that

it is the third time a student from his designer powerhouse at the Faculty of Mechanical Engineering has gained success in such a prestigious competition. Moreover, in the past the designs were in the concept category, while this one is in the product category. This makes the success all the more tremendous.

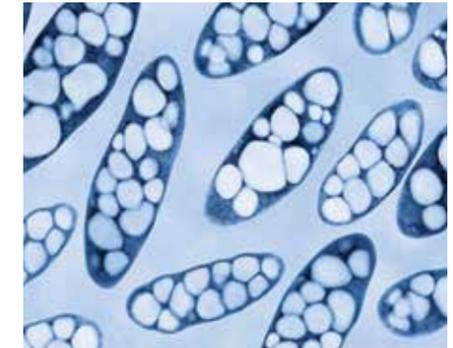
In June, the young designer went to Nordrhein-Westfalen in Essen for his award and, according to tradition, his design was on display at the special Design on Stage exhibition. He is almost shy when talking about his success, as if it came about just by accident.

There's no hurry. He is considering postponing his Master's project so he can stay one more year at the university. The reason is that, at twenty-two, he is the youngest among his fellow-students.

You can find designs of all types in Chlpok's web portfolio. Maybe industrial design is his favourite area – even if finding a special interest in sports instruments and electronic devices, he would still prefer to keep a general approach. "A little bit of this and a little bit of that," said the award-winning student. ■



COOPERATION



BUT Technology Will Help China

A new assembly line will be built in Suzhou, a China metropolis, to make biodegradable agricultural plastic foils based on Hydal technology as part of a project co-managed by the Nafigate Corporation in cooperation with the China-based Jiangsu Cleanet. It has been developed by a BUT team led by Professor Márová at the Centre of Materials Research of the Faculty of Chemistry. In 2015, the Hydal biotechnology won the Frost and Sullivan Technology Innovation Award, which is dubbed the Technology Oscar.

Made from used deep-fry oil, the biodegradable foil decomposes within 180 days in a field. "We and our Chinese partner both aim to build up a capacity to manufacture a PHA polymer along with the production of plastic foils. Being the world's biggest producer of agricultural plastic foils, China has huge problems with foils made of synthetic plastic. It lacks the capacity to produce a biodegradable replacement that does not damage the environment," added Ladislav Mareš, the chairman of the Nafigate Corporation board. The first foils could be tested in China already this year.

(red)

# The Orpheus Robot represents BUT

Text by Luděk Žalud, BUT FEEC, CEITEC BUT  
Photo author's archive

In late 2015, robotics researchers from Brno University of Technology gained renown at an international conference called Accelerating Innovation through Concept Development and Experimentation held in Berlin, Germany. Here, representatives from the Robotics and Artificial Intelligence group at the Department of Control and Instrumentation of the BUT Faculty of Electrical Engineering and Communication and from the RG2-2 CEITEC BUT group presented a robotic system called CASSANDRA, particularly its robot Orpheus. Aimed at accelerating the development of concepts and experiments, the event was held from 16<sup>th</sup> to 18<sup>th</sup> November 2015 by Allied Command Transformation together with the Ministry of Defence, Germany, and Joint Staff, Joint Force Development, USA.

The robots also attracted the attention of the Minister of Education during her June visit to BUT.



Luděk Žalud, František Burian, and Tomáš Jílek were invited to represent

development – editor's note). First, the Brno researchers gave a short lecture on how

were shown directly in the lecture room: control from a virtual-reality helm and a head-mounted display via multispectral data fusion. In this mode, in addition to seeing a coloured picture of the neighbourhood, the operator gets additional information on the ambient temperature, which could be of great help in many safety applications. Thanks to the perfect technical background provided by the organizers, a picture of the robot's user interface could be seen on the screen of one of the projectors, while a system description was

available on the other screen. A short break followed, during which the robot moved to a reserved underground car park. Here, interested conference participants could inspect and test the mechanism and other systems developed by VOP CZ and Czech Technical University of Prague. All of them showed avid interest in the exhibits and the entire presentation was openly praised by the high-ranking army officials present. What they appreciated most was the problem-free operation, reliability, and ease of control.

The Orpheus reconnaissance robots have been under development over ten years by the Robotics and Artificial Intelligence and CEITEC groups. Until the end of 2015, 11 types of such robots were presented divided into two groups – civil and military machines. Of the military robot group, a special mention is deserved by Orpheus-AC2, which has been used by the Army of the Czech Republic since late 2014. Concerning the civil part, the bulk of the research is concentrated on Orpheus-X4. This robot is now used to test three key technologies: the above-mentioned multispectral data fusion for tele-presence and autonomous mapping; exact external self-localisation (with centimetre precision) and navigation; and the automatic generation of radiation-intensity maps in a region of interest. The group works on these problems with partners from both the commercial and government spheres, other universities and organizations, particularly the National Radiation Protection Institute, the Military Research Institute, VOP CZ, University of Defence, and the Czech Technical University in Prague. ■

During the presentation were shown some examples of the robot's remarkable functions: control from a virtual-reality helm and a head-mounted display via multispectral data fusion.

BUT at the conference in the section Defence Policy and Strategy of the Czech Ministry of Defence, University of Defence, and VOP CZ (a company concerned with military technology production and

CASSANDRA developed at BUT and then demonstrated the robot Orpheus itself.

During the presentation, some examples of the robot's remarkable functions



## NEWS

### EVALUATION



### BUT was 19<sup>th</sup> in the Regional QS Ranking

The British based Quacquarelli Symonds (QS) has published its QS Top Universities ranking. In it, Brno University of Technology was included in the Very High Research category.

In a regional ranking that covers central Asian and European countries not including those of Western Europe, BUT was 19<sup>th</sup>. In this ranking, QS compares universities in 24 countries including Czech Republic, Slovakia, Poland, Russia, Hungary and the Baltics.

(red)

### TOPIC



### Building A1 after Renovation

The summer of 2016 saw the high-rise A1 building of the BUT Faculty of Mechanical Engineering at the Pod Palackého vrchem Campus come to life again after a thorough refurbishment. Officially, it was put into operation again on 20<sup>th</sup> June 2016.

With the foundation stone laid in May 1974, the building was finished in 1984 to house the Faculty of Mechanical Engineering and served until 2011, when its renovation was finally approved after several postponements. Later, the original project to refurbish the cladding was extended to include a major reconstruction. As serious defects were detected in the supporting pillars of the building, the pillars had to be reconstructed and, subsequently, all the storeys refurbished.

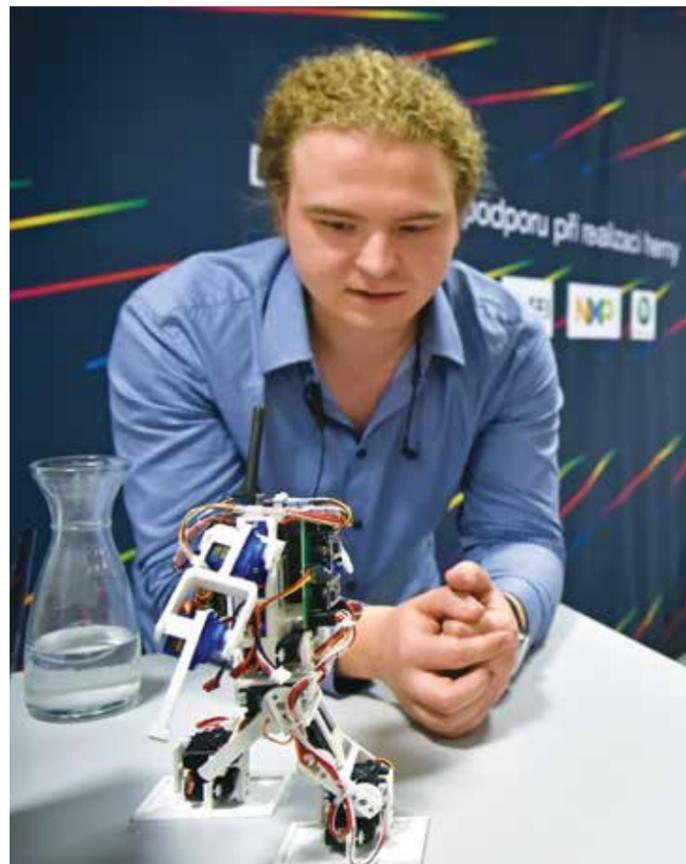
Gradually, the total renovation costs rose to 620 million CZK. At a height of 74 metres, A1 was Brno's tallest building until the spring of 2012, when the 111 metre-tall AZ Tower became the new champion; remaining the highest Czech building since then.

(red)

# New science-centre gaming room Electricarium

Text by Radana Kolčavová  
Photo Electricarium archive, BUT FEEC

Science can be fun, as evidenced by the growing interest in science centres that are popularizing scientific discoveries in an entertaining style. Exactly such a centre has been opened at the BUT Faculty of Electrical Engineering and Communication (FEEC). "This is a typical science-centre gaming room focusing on electricity and electronics," explained Vice-dean Jiří Háze. In "PerFEECt Electro Games" or the "Electricarium" programme, the gaming room currently offers fifteen exhibits that visitors can or, in some cases, even must touch.



The events in which visitors can take part include a competition for the best producer of electricity; they can also admire robots and a laser harp. "The exhibits, which we have bought for about 150,000 CZK, will be upgraded every six months," promised Háze. As the building of the centre included some renovation, its total costs have exceeded half a million CZK.

"We would like to attract more young people to technical sciences, particularly to electrical engineering," said Dean Jarmila Dědková, explaining the reasons for building the gaming centre. In her opinion, Electricarium can attract more target groups such as elementary and secondary school students and companies providing further exhibits for the centre.

The opening on 10<sup>th</sup> December of a new electric gaming room in Building T12 enticed numerous representatives from the media and companies. Unconventional exhibits were also admired by secondary-school students visiting the faculty during the Open House Days in December. "On the first day alone, the centre was visited by about 60 people, including students passing time between lectures, as well as former employees showing



the exhibits and the faculty premises to their grandchildren," added Daniel Janík,

produces electricity. Children will favour a robot football player," continued Janík.

Visitors just love to see new things. One of the most popular exhibits is a 'rotogen', which is an exercise bike that produces electricity. Children will favour a robot football player.

a FEEC student and auxiliary supervisor, describing the clientele.

"Visitors just love to see new things. One of the most popular exhibits is a 'rotogen', which is an exercise bike that

Electricarium can be visited by children from the age of five and there is no entrance fee for the general public.

In addition, the Electricarium opening at the faculty was accompanied by another

event. As it is, the Faculty of Electrical Engineering does not educate only university students. Pre-school children from a kindergarten in Babice u Rosic also presented their creations there. They all attend a hobby group focused on electric gadgets supervised by teachers from the faculty. "So far, they have made a police siren, a blinking Christmas tree, and an electronic die. I should also add that, for reasons of safety, each child is accompanied and helped by one of their parents," pointed out Háze. Children attend the hobby group regularly every two

weeks. The pilot project of cooperation with the kindergarten in Babice may be extended in the future. If everything goes well, faculty teachers will also offer such hobby groups to Brno kindergartens. ■

# BUT Chicken Wings scored a success in Kansas

“Design, Build and Fly” is the name of a competition held in Kansas, USA in April, in which a remarkable success was scored by the BUT team Chicken Wings. All its members study at the Institute of Aerospace Engineering at the Faculty of Mechanical Engineering. In contrast to the fragile and gentle name of their team, however, in Kansas the students proved ruthless and quick-witted – like entirely different birds.

Text by Kateřina Růžičková, BUT FME  
Photo BUT Chicken Wings archive

With the aim of taking part in the Air Cargo Challenge 2015, held in Stuttgart, Germany, the BUT Chicken Wings team was established in the autumn of 2014. They were given the task of designing and constructing a plane and presenting it at the international race. Their debut was successful. The fourteenth place, somewhere in the middle of the race results, was a major success for the novices. Encouraged by this achievement, this season, the students decided to register for the most prestigious competition of this kind. Organized by the American Institute of Aeronautics and Astronautics (AIAA) and with the support of Cessna Aircraft and Raytheon Missile Systems, this year's, the twentieth annual, Design, Build and Fly was attended by

143 teams from 32 countries from around the world.

In the meantime, the original four-member BUT team has expanded to include 28 first-to-fourth-year students, as well as some Erasmus students. In the preparatory part of the competition taking place in the respective home countries of the participants, everyone had to build a production plane that could carry a bottle of energy drink weighing 32 oz. in its interior, as well as a transport plane that could carry this production plane to the starting line. In addition to designing both planes, the teams had to decide how many parts the production plane would be divided into. Each part then had to be carried on a separate flight collecting extra bad points. BUT Chicken Wings decided to carry the production plane in one piece and it was this original concept that had a major effect on their placing

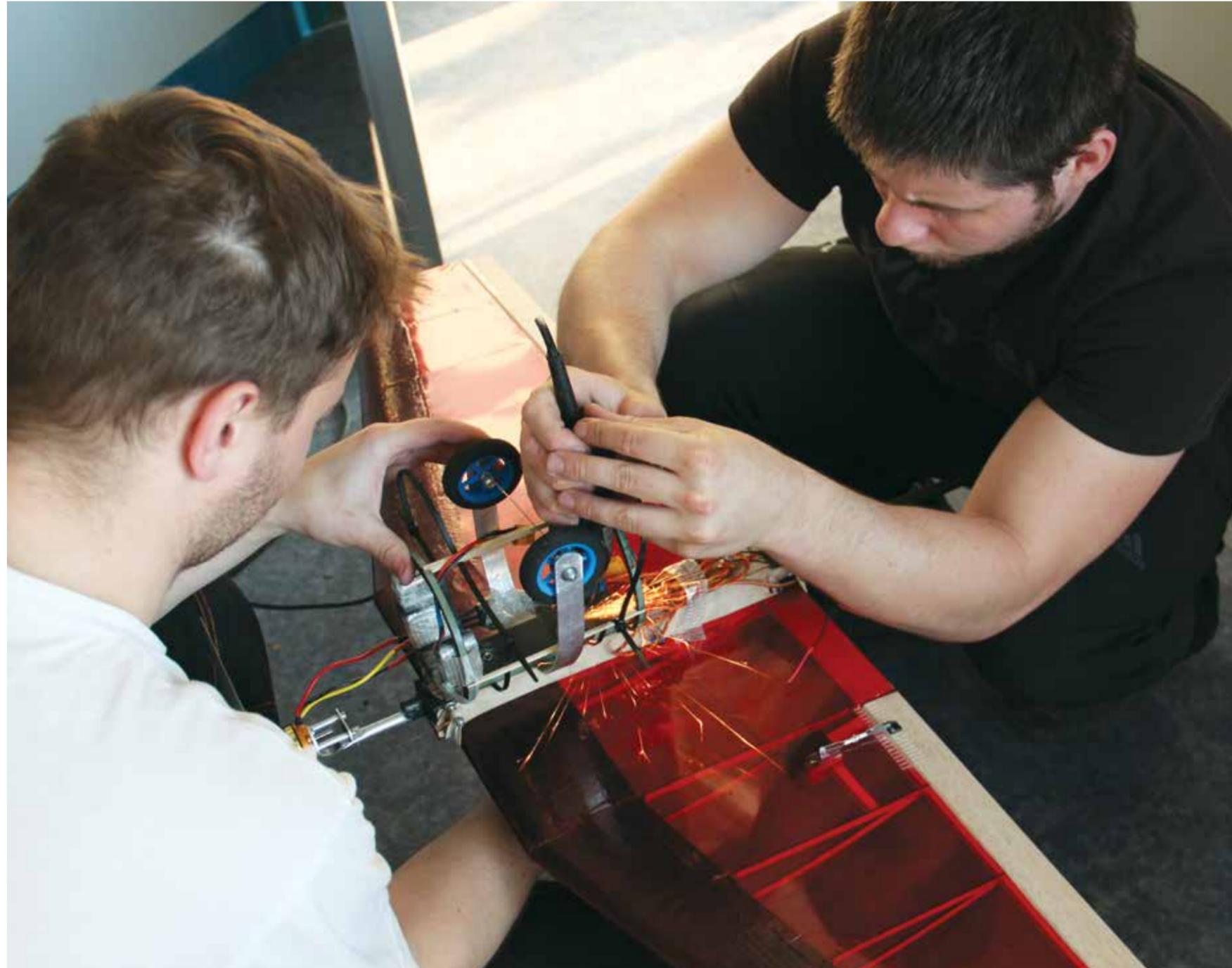
in the Kansas race, to which the team was invited thanks to their designs. “Building a plane that can carry another one broken down into smaller parts was not such a big problem, whereas transporting it in

one piece was a challenge,” said designer Jakub Zamazal, describing the way they had come to their decision. The students worked hard on the project from October last year, finishing just before

leaving for the USA. “The hours spent by all the team members on the project could be counted in the hundreds, if not thousands,” explained Tomáš Trojánek, the pilot and construction foreman. “The

flight testing was not easy at the beginning. We had to cope with such problems as loss of signal of the controlling transmitter and insufficient power of the transport plane driving unit,” added Jan Jílek, an expert in laminated structures. The technical problems were not the only difficulties they had to face in getting to the finals. “The most difficult part was no doubt raising funds for the costly transport to the USA. Although the sponsors were eager to provide us with materials for building the planes, for which we are most thankful, getting other funds was a problem,” said the team leader Vlastimil Hošek. “In the end, the most generous support came from the Faculty of Mechanical Engineering, to pay for the flight tickets of two team members.”

One of them was Tomáš Trojánek, pilot and fourth-year student, who confirmed that there was a friendly rivalry among the competing teams. Overall, BUT Chicken Wings came in 57<sup>th</sup> in the final competition of 93 international university teams. “Next year we would like to reconcile more our competing activities with the student duties,” said the team coordinator Jan Pejchar. “Students should be able to work on the design, implementation, and model calculations as part of the courses they attend, as is normal at universities abroad.” ■



# Art-Research Bridge between Brno and Reykjavík

Text by Monika Šimková, BUT FFA  
Photo from the author's archive

The foundations of an imaginary bridge between the BUT Faculty of Fine Arts and the University of Iceland School of Humanities in Reykjavík were formed in 2015. This happened during the implementation of an Art-Research Bridge project funded by the EEA and Norway grants as part of a cooperation programme. The primary construction material of the jointly built virtual bridge is the artistic and theoretical research of multimedia art and culture.

The project extends previous cooperation with the National Art Gallery in Reykjavík and its multimedia Vasulka Chamber. This research and presentation centre bears the name of Mr and Mrs Vasulka, who achieved world renown as pioneers of Scandinavian digital and video arts. Woody and Steina Vasulka are also an important link between Reykjavík and Brno. While Woody Vasulka comes from Brno, his wife Steina was born and spent her youth in Reykjavík; she met her future husband in Prague, where she was trained as a classical musician and violinist.

Tomáš Ruler, Head of the Performance Studio of the BUT Faculty of Fine Arts, joined his interest in the work of the Vasulkas with that of

Kristín Scheving, the Curator of the Vasulka Chamber project and then with that of Hlynur Helgason, Head of the Department of Icelandic and Cultural Studies at the University of Iceland. From there, it was just a small step to the joint art research project implemented recently by both universities.

At the end of May, a Brno team of two teachers and two students of the Faculty of Fine Arts set out on a week-long expedition to Reykjavík. Together with their Icelandic colleagues, the Brno artists participated in a workshop on digital art and new media. Thus, a new link was created between two creative approaches: artistic, represented by the Brno multimedia artists,

and an art-research one by art historians of the Department of Icelandic and Cultural Studies. One of the outcomes of the joint week's work was a presentation at an exhibition of the National Gallery of Iceland. Crammed with events, the week in Reykjavík finished with a Nordic Art History conference. Jennifer Helia DeFelice, a doctoral student of the Faculty of Fine Arts, presented her paper in the Performance as Art section.

Receiving the symbolic name of Art-Research Bridge, the project found its highlight in Brno in October 2015 at an international conference and workshop attended by the Icelandic partners. The central theme of the conference, held on 20<sup>th</sup> and 21<sup>st</sup> October under

the title Intuition, was the research and reflection of the human use of intuition in the digital era. As a topic, intuition was treated in a wide range of forms in presentations by conference participants. They also had an opportunity to observe two exceptionally remarkable

works of modern architecture at close quarters as the venues of the conference were in two places on subsequent days: the Stiasny Villa on the first day, and then the Open Garden in Údolní Street, the office of the Partnership foundation.

The October conference was by no means the end of building a bridge between Brno and Reykjavík. The fruitful cooperation, beginning with a common will to reflect, maintain and develop the artistic legacy of Woody and Steina Vasulka, will continue and for the Brno

team, the previous experience of their Icelandic colleagues in building the multimedia Vasulka Chamber laboratory will remain a permanent inspiration. One of their common plans for the future is the building of a similar multimedia laboratory in Brno. ■



# Tamar Newberger is interested in IT-related gender issues

Text by Jan M. Honzík, BUT FIT  
Photo the author's archive

Late last year, the BUT Faculty of Information Technology (FIT) was visited by Mrs Tamar Newberger, wife of the US ambassador to the Czech Republic. The reason of her visit was purely professional – Mrs Newberger was an informatics student and after graduation worked with both small companies and major corporations in the USA.



Mrs Newberger's IT career was quite remarkable, starting as an engineer at Bell Laboratories, then becoming a systems engineer, and ending up in high managerial positions. She is still active in business, as well as engaging in education and politics, especially focusing on support for women in the IT industry. She was pleased to accept the invitation by FIT to deliver a lecture on 3<sup>rd</sup> December on her professional career and jobs with IT companies as seen by a woman.

"I met Mrs Tamar Newberger about two years ago in connection with a Computer Summer School Not Only for Girls, in which she was very interested. Already at that time, I invited her to come and see our faculty," reminisced Jan M. Honzík, who has long been advocating IT being made more attractive for girls. "Following my invitation, Mrs Newberger visited the Gaudeamus education fair in Prague, appreciating the efforts to inform secondary-school students on the university study options. From that time on, we were looking for a suitable date for her to visit Brno until we found one at the end of last year. Mrs Newberger inspected the faculty campus, admiring the

impressive library and lecture rooms equipped with state-of-the-art technology, as well as the reconstructed historical part of the campus."

Honzík described the lecture that followed as lively and well structured: "Tamar was throwing in witty remarks with flamboyant gestures, enthraling the crowded auditorium." The lecture was also attended by students and teachers from other faculties, such as the Faculty of Informatics at Masaryk University. In closing her lecture, Mrs Newberger gladly answered a number of questions and would have continued to debate, if it had not been for her schedule. Even after the discussion, she

Mrs Newberger's IT career was quite remarkable, starting as an engineer at Bell Laboratories, then becoming a systems engineer, and ending up in high managerial positions.

was still surrounded by eager audience members asking her questions mostly concerning study in the USA. "I also introduced Mrs Newberger to several young women who had been participants in the above-mentioned "computer summer school not only for girls" and who were now studying at the faculty," said Honzík.

A working lunch followed, with the American visitor and Honzík being accompanied by Dean of Faculty of Information Technology, Pavel Zemčík, and the Head of the Department of Graphics and Multimedia section, Jan Černocký. Asked about her impressions of the lecture, Mrs Newberger said

she liked some of the interesting questions posed by the students, as they were much more sophisticated than the ones she was accustomed to. She was also surprised by the marvellous symbiosis of the historical part of the campus, which used to be a Cartesian monastery, and the state-of-the-art equipment. The afternoon programme then continued with a visit to Villa Tugendhat, after which prizes were awarded to the best start-ups at the South Moravian Innovation Centre.

Everybody enjoyed the visit of the US computer scientist, taking it also as motivation for further work. "We are glad that Mrs Newberger was interested

in the teaching and research activities at our faculty and was inspired by its atmosphere," concluded Honzík. "As we know that her speciality is IT-related gender issues, we hope that she will also accept our invitation to this year's tenth summer computer school at the end of the summer holidays." ■

# Dubna Days are not only for nuclear scientists

Text and photo by Karel Katovský, BUT FEEC



There are several milestones in the history of nuclear power engineering and research, such as, no doubt, Sir Chadwick discovering the neutron and Enrico Fermi engineering the first controlled, self-sustaining nuclear chain reaction under the west stands of old Stagg Field at the University of Chicago in 1955. It was also that year when the first international conference was held in Geneva on the peaceful use of nuclear energy and President Eisenhower delivered his speech Atoms for Peace at a UN assembly. With research institutes and nuclear university departments beginning to spring up all over the world, inspired by the CERN research institute in Geneva, the Joint Institute for Nuclear Research (sometimes dubbed "the eastern CERN") was established in Dubna near Moscow two years later. The then Czechoslovakia was among the founding members. The institute still offers unique opportunities to Czech research groups, particularly students, and the cooperation has been successfully extended to Brno universities.

When looking at the Periodic Table of Elements, we may wonder about the element Flerovium with atomic number 114, or Dubnium with atomic number 105. They were actually named after the town of Dubna, where they were discovered, and Georgy Flyorov, the long-standing leader of the Dubna team conducting research on super heavy elements. Not only new elements, but also some new elementary particles and Cherenkov radiation were discovered at Dubna. Being the leading fundamental and applied research institution in nuclear physics, superconductive technology, radiobiology, nanotechnology, research of environmental pollution, and radiotherapy, the Joint Institute for Nuclear Research

operates several accelerators and a unique nuclear reactor. There are several thousands of scientists from 24 countries working there, publishing their results in the most prestigious journals, and receiving various prizes including the Nobel Prize.

In the second week of September, 18 Czech scientists – half of them from Brno, including four from BUT, two from Masaryk University, and the rest from Mendel University, the University of Veterinary and Pharmaceutical Sciences, and the University of Defence – arrived in Dubna. Staying one week, we inspected all the major laboratories, the basic research infrastructure, and learnt about the current work



of the Czech research groups. We were surprised by the attention paid to cooperation with our universities and interest in our engineers, not just the nuclear scientists. The institute is being extended on a continual basis with new accelerators being designed and built, and laboratories and buildings modernized.

In return, in the last week of October, representatives from Dubna came to Brno to attend Dubna Days in the Czech Republic. Eight of the institute's high-ranking officials, including the director, presented the institute at the BUT Faculty of Electrical Engineering and Communication at a seminar organised under the auspices of its vice-dean, Vladimír Aubrecht. The event was attended by 59 people from six universities, two institutes of the Czech Academy of Sciences, and two companies.

The guests from Dubna then visited the CVVOZE, NETME, and IT4I laboratories, the CERIT centre at Masaryk University, and laboratories at Mendel University and the University of Veterinary and Pharmaceutical Sciences.

Our students, that is, our future nuclear, electrical, mechanical, and IT engineers, are very much in demand in Dubna. For a number of years, BUT students have been participating in summer on-the-job-training in Dubna, as well as working on joint undergraduate and doctoral degree projects. We believe that the cooperation will increase and improve the quality of our students' degree projects and the research conducted at our alma mater. ■

# ExFoS showed present state of forensic engineering

ExFoS 2016, the 25<sup>th</sup> annual conference organised by the BUT Institute of Forensic Engineering together with the Czech Association of Forensic Experts and Assessors and the European Association for Accident Research and Analysis, was held at the Institute's new building on Purkyňova Street. Arriving in Brno on 29<sup>th</sup> and 30<sup>th</sup> January, forensic engineers met in three key sections. In the plenary session, the participants learned about the present state and future development of forensic engineering.



Text by Vladimír Adamec et al., BUT IFE  
Photo by Igor Šefr

The programme of the section Analysis of Road Accidents, Assessment of Motor Vehicles, Machines and Devices was varied. The conference's key topic, motorcycle accidents and safety, was supplemented with interesting lectures by invited speakers from Ireland, Austria, and Poland. In addition to theoretical lectures on this topic, including the behaviour of motorcycle drivers, the speakers gave practical demonstrations, such as airbags for motorcycle crews. When speaking about accidents resulting from poor visibility, the participants also touched on road lighting, pedestrian crossings, etc. Mechanical engineers presented problems of vehicle emissions and bolted joints in car manufacture. Much emphasis was placed on economic issues related to assessing motor vehicles and property damage.

Traditionally offering a wide spectrum of topics, the section Civil Engineering and Real Estate Assessment was subdivided into three areas: civil engineering law; issues related to buildings, their construction and technical properties; and assessment of immovable property. Legal experts debated about the laws in the pipeline, such as an amendment to the building act and laws on the energy evaluation of buildings. In civil engineering, questions were raised about the suitable methods for measuring the reasonable wear of a building. In the assessment of real property, the presentations focused on immovable property, current assessment methods, as well as on the much debated building

entitlement assessment and sales of land in agricultural

and environment. A special topic was the imminent safety



zones. The presentations giving overall appraisals and specific conclusions were indeed a contribution to the conference participants engaged in economics; these included the Assessment of Immovable Property and Defects and Failures of Constructions.

For the last three years, risk engineering has formed a separate conference section for forensic engineers and experts dealing with questions of risk control in technical and economic fields. On the first conference day, the main topics were current threats and risks for society and the critical infrastructure, with information on the current changes in the ISO standards and legislation. On the second day, the debated issues included the use of risk engineering methods by forensic experts, and the risk of hazardous substances and their effect on the human health

issues of cyberspace. During the conference, the participants discussed the importance of risk engineering and its practical application. In the final discussion, the guests adopted a resolution on the need for including risk-related subjects in the curricula of technical and economics courses.

You can find reviewed proceedings and information on this conference and on ExFoS 2017 at: [www.exfos.cz](http://www.exfos.cz). ■

# Brno Ph.D. Talent 2015

Text by Jana Novotná  
Photo by Igor Šefr

Fifteen talented doctoral students from Brno universities, with six BUT students among them, gained scholarship cheques for 4.5 million CZK because their projects had been selected as successful in the Brno Ph.D. Talent competition. In an effort to stop the exodus of doctoral students from their home universities, they are offered scholarships in support of their full-time research. The students received the money from Mayor of Brno Petr Vokřál on 25<sup>th</sup> February 2016 in Knight Hall of Brno City Hall.

The six BUT scholarship recipients were Mariano Casas Luna from CEITEC BUT for his project on the structure and properties of hydroxyapatite-magnesium composites made by streamed infiltration sintering; Jana Damková from the Faculty of Mechanical Engineering for her project on micro-robots and photonic crystals self-arranged by light; Lukáš Flajšman from CEITEC BUT for his project on magnetic meta-materials to be applied in magnonic devices; Martin Hruška from the Faculty of Information Technology for his project on static analysis

Brno Ph.D. Talent project effort to stop the exodus of doctoral students from their home universities, they are offered scholarships in support of their full-time research.

of programs; Jiří Marek from the Faculty of Chemistry for his project on waste water as a source or renewable energy; and Miroslav Zeman from the Faculty of Electrical Engineering

and Communication for his project on determining the neutron flow in a uranium spallation target.

"I will use the money just for living," said Jana Damková, confirming the well-known fact that young scientists, apart from having research problems, must often scrimp just to make ends meet. Ranging between 5,000 and 8,000 CZK (200 and 320 USD), the doctoral scholarship is either their only income, or they have to earn additional money elsewhere, which of course is not the best way to

study. "The scholarship is paid out four times a year over three years. Considering the requirements of university study, the extra money is welcome," explained the doctoral student.

Open to students of all Brno universities, the competition is intended for first-year doctoral students of engineering and scientific study fields. It is preceded by a rigorous three-stage selection procedure. The projects are judged by an international panel, including grant evaluators of the European Commission. From this year's 30 finalists, expert commissions chose 15 students, each receiving a 300,000 CZK (12,000 USD) scholarship.

"The Brno municipality have been supporting science and research for a long time. Each year we try to spend more money from the budget, knowing that this will improve Brno's competitiveness on the international scale. Moreover, these talented young people improve the quality of research and development conducted in Brno attracting more international scientists. Investment in talented youth will bring returns to our town," said the

Mayor of Brno after presenting the cheques to the winners.

Asked if there was time to celebrate the success, Jana Damková answered, "After the ceremony, most of the award-winning students along with the organizers went for lunch

together to meet and talk about what everybody was working on and about our specializations." Over lunch, the topics varied: "Rather than about our impressions, we talked about the topics of our doctoral projects. We had already known for some time that we

would be the winners, so the initial euphoria was partially gone," added the successful doctoral student, who studies at the Institute of Physical Engineering of the Faculty of Mechanical Engineering in cooperation with the Institute of Scientific Instruments of the

Czech Academy of Sciences on her doctoral project. Although she has no particular future plans for the time being, she stated that "the priority for me is to finish this study program over the next four years." ■



# Young Architects Won an International Competition in Berlin

Text by Radana Kolčavová  
Photo ŠPROM archive

A five-member team from the BUT Faculty of Architecture is the winner of an architectural competition for the use of Berlin University Residences. Their task was to design temporary accommodation for tourists and students in Kreuzberg, which is an artistic district of Berlin. To win the first prize, the project of the young Brno architects defeated more than 280 other architectural designs from all over the world.

“We knew that if we designed an ordinary house, it would drown in the sea of other designs. In the end, the idea of leaving the area undeveloped or just slightly developed became the winning concept. We tried to engage the genius loci of the place,” said Pavel Čučka, student of the BUT Faculty of Architecture. Finally, the five students came up with the seemingly absurd idea of preserving the locality’s open space, transforming it into a site for arriving guests to pitch a tent, park a caravan or moor their houseboat alongside a pier. This is because Kreuzberg is known for its multi-cultural character and street art.

“We wanted to stress the free-spirited approach allied



with today’s Berlin, realizing that the only thing that is constant is change. In this way, our design has an intrinsic quality of metamorphosis. It offers leeway for interpretation,” explained Čučka of Š.P.R.O.M., the acronym of the winning team derived from the initials of the young architects.

Of the more than 400 candidates that signed up, only 258 student teams submitted their projects. The jury paid most attention to the idea of free living: “This type of community living requires a great deal of tolerance, understanding and cooperation at the beginning, exactly the principles that today’s individualistic society seems to be losing,” read the abstract for the winning project.

“Looking at the other winners, you will see that these are all teams from prestigious international universities. We are happy about the success of our students because they have brought about something that sometimes even seasoned architects don’t achieve in their lifetime,” said vice-dean Petr Šmídek, commenting on the victory at the international architectural competition.

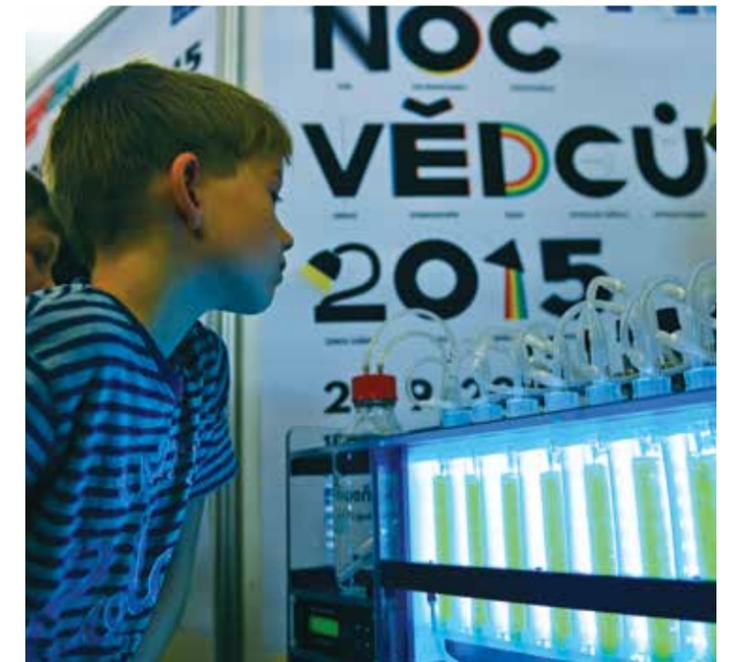
Consisting of Štěpán Vašut, Pavel Čučka, Radka Vilímková, Ondrej Palenčar a Martin Kůs, the winning team will receive 2,500 EUR in reward. ■



# See the Light at the Night of Scientists

BUT participation in this year's Night of Scientists, a nationwide event popularizing science and research, was extraordinary in the number of participating faculties, as well as in the event's record attendance. The participants of a programme prepared by the teachers and students of five BUT faculties set out into the night to see the light. The organizers joined the International Year of Light and Light-based Technologies, proclaimed for 2015 by the UN General Assembly, adapting the event programme accordingly. Thus, the central theme featured by the BUT scientists and researchers consisted of light-based scientific discoveries and was presented in an amusing manner to the general public.

Text by Jana Novotná  
Photo by Igor Šefr



# ICEM Conference Says Europe Is a Sleeping Lady

Text by Iveta Šimberová and Anna Kruljácová, BUT FBM  
Photo by Benjamín Červený

In terms of a smart and efficient economy, the European countries may be regarded as rather hesitant. This is the conclusion of a 21<sup>st</sup> International Conference on Economics and Management (ICEM) held at Brno University of Technology (BUT) in May 2016. It was hosted by the Faculty of Business and Management under the motto Smart and Efficient Economy: Preparation for the Future Innovative Economy.

The idea of a joint international conference of economic faculties was born six years ago at the 14<sup>th</sup> ICEM. Organized by the School of Economics and Management KTU, Lithuania, it was joined by BUT Faculty of Business and Management, the Tallinn School of Economics and Business Administration TTU, Estonia, and the Faculty of Engineering Economics and Management RTU, Latvia.

That this was the right decision is evidenced by the number of participants at this year's conference, reaching 150 from over 20 countries. The conference was honoured

by the presence of David Smallbone, a renowned expert from Kingston University in London. After delivering the introductory speech with the title Revisiting Entrepreneurship in a Transition Context, he participated in a lively debate in a panel of practicing professionals.

Much attention was attracted by Lenka Mynářová of the NAFIGATE Corporation, because of her enthusiastic views and witty remarks on international events when talking about her experiences in China when launching a BUT designed technology for

recycling used deep-fry oil. The discussion was also joined by Dagmar Vávrová, head of the Technology Transfer Office at BUT, Vojtěch Krmíček from the South Moravian Innovation Centre, and Michal Bolek from AŽD Praha (Automation of Railway Transport).

In a vivid discussion, there were many views suggesting that Europe doesn't seem to

be prepared for Smart and Efficient Economy, but instead characterised, as it were, as a sleeping lady who cannot make a decision on how to deal with the future she is facing. Other presentations in the afternoon sections made it clear that the main topic had been chosen well and the conference had achieved its goals of opening a discussion on Europe's preparedness

for the coming innovative economy and deciding that the discussion topics should further include a new industrial revolution. These will form the basis of next year's conference, to be held in Riga, Latvia, where experts will be able to join the most innovative call – Industry 4.0.

The conference was also attended by students of the

BUT Faculty of Business and Management. One of them, doctoral student Peter Kita, most appreciated meeting interesting people who can help him write a doctoral degree project and further papers. "Being a doctoral student, I took the opportunity to present and discuss my own views. The rich social programme then helped me participate in further interesting debates," said Peter Kita.

Students of the host faculty, however, were also helping out at the conference behind the scenes. One of those who regularly helps organize international conferences is Anna Kruljácová, member of the student chamber of the faculty academic senate. "Organizing ICEM 2016 was another experience that made it possible for me to meet old acquaintances as well as new interesting people. For us students, this is also an opportunity and challenge to use our language skills and help the faculty cope with the organization," concluded Anna Kruljácová. ■



Dean of the Faculty of Business and Management Stanislav Škapa with the dean of School of Economics and Management KTU in Lithuania

# Sign Language Dictionary

Text by Naďa Botková,  
Consulting Centre of the BUT LLI  
Photo by Igor Šefr

As the numbers of the hard of hearing and deaf students and study candidates have recently been growing, the simultaneous translation of lectures into sign language is becoming more commonplace at BUT. It is no wonder that BUT has employed two sign-language interpreters and is developing new signs for engineering.

The job of interpreting into sign language at technical schools is challenging, as it requires the knowledge of a sufficiently large sign vocabulary for a variety of engineering fields. As the number of deaf technicians with university education is low, many special terms are not used and, until recently, there have been no Czech sign language equivalents for some of them. Today, however, this is changing as the new signs required for many technical concepts have been defined and published in a BUT Dictionary of Selected Technical Terms.

Still one of a kind at Czech technical universities, the dictionary has been compiled specifically to meet the needs of translating technical lectures at BUT. It may be used in two different ways: while allowing for simultaneous translation at lectures, it also helps improve the quality of deaf students. As graduates from a top-level technical university, they will be able to talk to each other about

technical subjects in their own language at a university level, which has not yet been possible.

The present graphic layout of the dictionary is given by its purpose. This includes the creation of a sufficient vocabulary of signs for courses attended by deaf students this academic year in which sign language interpreters are needed. Improvements to the dictionary's graphic design are foreseen, as well as an increase in the vocabulary of other courses.

The publishing of the dictionary has been organized and financed by the Consulting centre of the BUT Institute of Lifelong Learning in cooperation with sign language interpreters, deaf BUT students, and teachers from the BUT Faculty of Mechanical Engineering in charge of the curricula of selected courses.

You can visit the dictionary at the Google-Chrome-optimized <http://slovníkczj.vutbr.cz/site>. ■



# ARTE!FAKT

Text by Jana Novotná  
Photo arcSiola archive

Last month, open spaces in the Židenice City District of Brno turned into free creation zones for young civil engineering and fine arts students of BUT. The local authorities asked them to design solutions with artistic elements for particular localities of their neighbourhood. So, becoming involved in public affairs, the architects-to-be started an ARTE!FAKT workshop, coming up with a number of designs, of which some may be implemented.



“Realizing what this occasion calls for, we decided to organize a workshop with the special aim of providing the open spaces with works of art. For students, this was an opportunity to join forces in working on a project to find a comprehensive open-space solution with the architect and the artist working hand-in-hand,” explained Václav Kočí, a teacher at the Institute of Architecture of the BUT Faculty of Civil Engineering. Matěj Smička, chair of arcSiola, a faculty student association, took on the task of organizing the project, not hiding his contentment at having civil-engineering students involved in the project. “Their participation was one of the aims we wanted to achieve – creating an artistic artefact in the open space through team cooperation between architects and artists, with each of them coming up with their own ideas,” he continued.

Because Židenice lacks a natural historical centre, two major squares were chosen for the workshop – Karáskovo Square and Juliánovské Square. “Most of the teams chose Juliánovské Square, which, with its large green park, gives you the impression of a clean slate,” said the main organizer. Karáskovo Square, on the other hand, with its Vysočina sculpture by Jiří Marek imposing some limits on the authors, was only chosen by two teams. Taking place in the Židenice Dělnický dům (House of Workers), the workshop was led by Marek Štěpán, who himself advocates the symbiosis of art and architecture. “ARTE!FAKT was quick

and lively, clearly outlining the weaknesses of the Židenice open spaces for the municipality to focus on,” said architect Štěpán, commenting on the project’s purpose.

The students worked in several teams including both architects and artists. “First, an initial analysis was made of the place, comparing all the ideas and, as a next step, the architects were concerned with their programs, while the artists were drawing or making models,” said Matěj Smička, describing the work. As an

ARTE!FAKT was quick and lively, clearly outlining the weaknesses of the Židenice open spaces for the municipality to focus on. The students’ solutions were intuitive and emotional. They could be seen as throwing aside a gauntlet for the municipality.

organizer, while following the doings in his own group, he also had to keep an eye on the activities of others. “The party spirit is always important in every group and it was really tremendous in each of the teams,” pointed out the chair of the student association, praising the achievement of the workshop’s main goal. “We would like to further promote the good relations between the Institute of Architecture and the Faculty of Fine Arts, communicating and cooperating more in the future,” said the organizer.

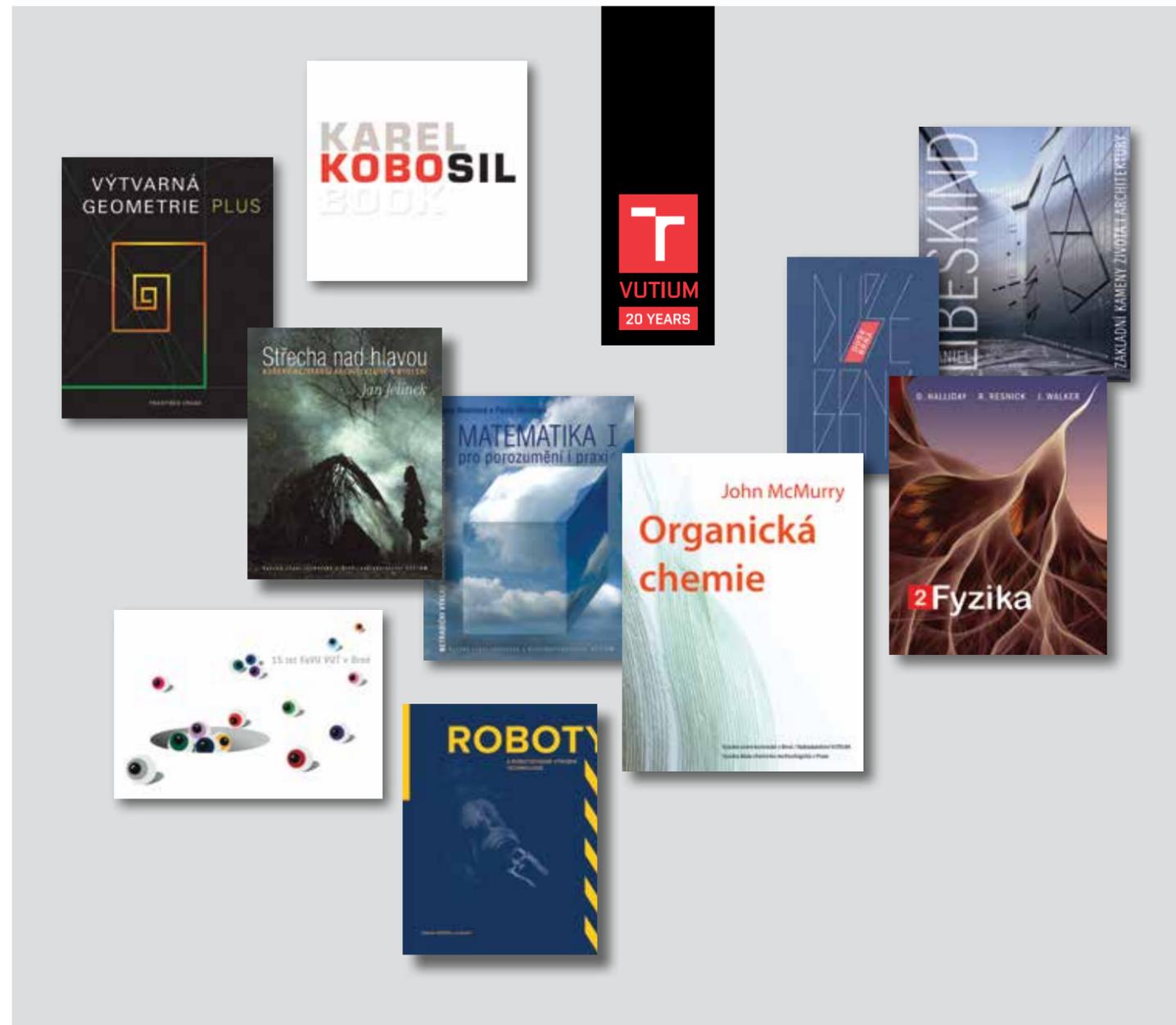
The outcomes of the workshop will be on display in the Židenice city light boxes and on the web. If we succeed in starting a tradition of cooperation

between universities and communities, the topics for the next workshops are clear. “Although this was a competition of ideas, I believe that the teams also took into account their implementations, as is the case with most faculty projects,” explained Matěj Smička. In his opinion, the main benefit of the project for the participants is that some of them may have worked in a team for the first time, which is something to cherish for the future. “For me personally, this was the first time to enter into negotiations with municipality

officials. I have learned a lot and it is a big challenge for organizing further events,” added Smička.

“The students’ solutions were intuitive and emotional. They could be seen as throwing aside a gauntlet for the municipality, or, suggesting, as it were, from which new angle a task should be viewed and where it could be started,” concluded Marek Štěpán. ■

# VUTIUM Press Celebrates its Twentieth Anniversary



It is now twenty years that the VUTIUM Press foundations were laid at Brno University of Technology. After the changeover in November 1989, the BUT University Press mark started to appear on all the textbooks published by the university. For the next few years, a publishing house was hired with a quality PC DIR printer. Founded in the early 1990s, CERM Academia Press has been cooperating with BUT, providing it with a chain of retail bookshops. Finally in 1996, VUTIUM Press was established as the central publisher for the university.

Text by Karel Blažek, director, VUTIUM Press, and Jana Novotná  
Photo VUTIUM Press archive

Each university faculty and constituent part edits its own textbooks and simpler publications, while VUTIUM Press focuses on those publications that are more demanding in terms of finance and the organisation of managing the ISBN series assigned to BUT. After the first years of its existence, VUTIUM Press achieved the status of a leading and renowned publisher of specialized academic literature in the Czech Republic.

For the first eleven years, VUTIUM Press was headed by Ms Alena Mizerová. "I was lucky to be able to work with some fine persons of the then BUT management who favoured close cooperation grouped around rectors Petr Vavříň and, later, Jan Vrbka. Over the eleven years of my office, a series of translated textbooks was initiated. I still appreciate the courage of the then management, notably the bursar Alexandr Černý, who in 1998 backed a financially demanding pioneer project of translating the large textbook Physics," recalled the founding director about the beginnings of VUTIUM Press. "Together with Jaroslav Kadrnožka, the then vice-rector for research,

I helped establish the BUT Scientific Writings series. Later on, we managed to gain Mr Kadrnožka as the author of the book Energy and Global Warming, which received the prestigious Josef Hlávka Prize. For a long time, the publishing activities at BUT were influenced and developed by vice-rector Petr Dub, a man open to university cooperation on an international scale. For the new Quantum series

The backbone of its Edition programme comprises of a number of major university textbooks – mainly translated titles, for example Organic Chemistry, Physics, Design of Machine Parts.

that we initiated, he gained the book What Is Life by Erwin Schrödinger," continued Mizerová, enjoying the fact that VUTIUM Press is carrying on a good old tradition, extending the existing series and creating new ones.

In 2007, Karel Blažek succeeded Alena Mizerová in the office of director. Soon afterwards, in continuation of Mizerová's work in cooperation with the University of Chemistry and Technology, Prague, the new title Organic

Chemistry by John Murry went into print. "It was then the first Czech edition of a world-renowned textbook, which is still on the book shelves in our shops. It was when I was presenting the book to the public in November 2007 and visiting the Frankfurt book fair a month before, that I fully realized how important a publishing house I had ended up working for," reminisced present director Blažek.

VUTIUM Press continues the tradition embarked upon twenty years ago. The backbone of its Edition programme comprises of a number of major university textbooks – mainly translated titles (Organic Chemistry, Physics, Design of Machine Parts), but also local ones including Mathematics for Understanding and Practice in three volumes, with the last one being finished this year by Brno authors Jana and Pavel Musil. "I wish this series included more such works by

local authors," admitted Blažek. "In addition to such large publications, sometimes weighing up to six pounds, we of course also publish less voluminous books, with different levels of impact, some of them in cooperation with other publishers. At exhibitions and book fairs both at home and abroad, we have gained confidence, as the titles published by VUTIUM Press have achieved renown mostly among experts and our European partners."

Held in Rajhrad near Brno, an exhibition featuring Brno university presses was a forerunner, as it were, of VUTIUM's anniversary in that it portrayed its friendly cooperation with other university presses. "It is our sincere wish that VUTIUM blossoms in the next twenty years with plenty of good authors and titles helping to maintain its prominent position among university and other specialised academic publishers at home and in Europe," said VUTIUM's current director.

In conclusion, he added that all of this year's titles published by VUTIUM Press will bear a sign commemorating its twenty-year anniversary and history. ■

# Sports Day: Strained Muscles and Smiles

Text by Tereza Pišová, BUT CSA,  
and Jana Novotná  
Photo by Michaela Dvořáková

No doubt, the fair weather played its part, too, but this year's third annual Sports Day at BUT has made it clear that such an event is needed. It was attended by almost 500 people, which is nearly 200 more than last year. In this way, the BUT staff clearly showed that, from time to time, they do feel like leaving their offices and laboratories for a workout. For this day, the BUT Centre for Sports Activities prepared a number of field events and tournaments, as well as hiking, biking, and boating trips. This year, for the first time, those not enthusiastic about organized events could also participate in designing their own workouts.

The Rector's Challenge Cup for the faculty or constituent part with the most proactive approach went to the Faculty of Civil Engineering, with the highest number of participants. The proactive civil engineers set out in separate groups on several hiking trips and organized their own pétanque tournament. They certainly deserved the cup, even if closely followed by the staff of the rector's office.

Hiking in the suburban landscape met with the most favour. Starting at Palacký vrch campus near the CSA building, the hiking route went around Medlánky Airport to the Brno Reservoir, continuing around Veveří Castle to the city district of Žebětín. The less trained participants were dropped off at the reservoir or castle. Karla Kučerová (FA), of the hiking party, was full of praise: "Well organised, friendly atmosphere, and free chocolate at the start as a bonus. A plus point to the organizers and long live next year's hike!" Also satisfied was Zdeňka Kaloudová (FBM), who was new to Sports Day: "The

trip around the Brno Reservoir was immaculate – a perfect workout and a lot of fun, making you maybe ten years younger!" For Renata Kohlová (FIT), on the other hand, this was her third year in a row: "Again, I chose Nordic walking. It was good, even if the starting tempo was a bit too fast for me. My friend and I had to stay with the pack to find our way around the airport and to the village with the U Šuláka restaurant." She suggested, "Next time I would appreciate having a website to download a map with the route so I could go at my own pace."

Seasoned hikers could use a bus to take them to Raxalpe in the Austrian Alps. "Nothing was missing – sunshine, snow, beautiful scenic vistas, good food and drink, animals such as chamois on the alpine pastures – a good workout for the body and a balm for the soul. There's nothing more you could wish for!" said Vlasta Kňourková (CEITEC BUT) about the day in the Alps that she spent with her friend, Petra Zavadilová. "Even if the first climb was a bit strenuous, it

was worth it. My knees permitting, next time I am coming again!" said the alpine hiker, looking forward to the next climb. With the same intentions, Jaroslav Matuška (FME) liked the way the trip was organized. What his friend, Matyáš Chaloupka, appreciated most was the day off to escape from the work routine: "An ideally spent day amid the examination period, leaving my

worries behind and then coming back from the mountains with a clear head!"

Roman Brzoň (FCE), on the other hand, was among those relaxing in a gym. Participating in a badminton tournament, he had no regrets: "The organization was super and so were the competitors. We enjoyed all this and look forward to next year." One of

those playing badminton was also Tereza Lošková (FC), who suggested that the Sports Day could take place twice a year. Although Stanislav Klusáček (FEEC) was injured in a floorball match, he is still planning to participate next time: "Such a fabulous match – we really enjoyed it. Even if it resulted in a ruptured external ligament, torn Achilles tendon, swollen knee,

and strained back, everybody is looking forward to next year." As perfect relaxation at the end of the academic year, this is how Jakub Horák (FC) sees his participation in the Sports Day. He played for one of the teams of the kin-ball tournament. By contrast, Marta Horáčková (FC) chose an outdoor sport: "We enjoyed playing both volleyball and football. Despite my body

aching all over, I still think it was fantastic. My colleagues and I would welcome more of such events."

Summing up, although there were some accompanying troubles such as strained muscles and other minor injuries, it is clear that the expectations were met. ■



## PRESENTATION



Photo by Kamila Vymalická

### "Eight from BUT" for the Third Time

The best BUT final-year bachelor students took part in a competition held at Era svět in Prague on 30<sup>th</sup> November 2015 to find the best presentation skills and ideas. Co-organized by BUT and ČSOB, this third annual "Eight from BUT" contest again demonstrated the high standard of bachelor projects.

Of the eight representatives from the eight BUT faculties, the most attention was paid to Klára Zárybnická from the Faculty of Chemistry, who presented a project to find the possible use of fluid ashes in self-levelling systems. The second prize was shared by Zuzana Mikulášková (FBM) and Tomáš Prokop (FFA), with the latter being most liked by the competition guests and receiving a prize from ČSOB, a contest partner. The third prize then went to Iveta Pospíšilová (FCE), Tereza Nováková (FEEC), Gabriela Olivíková (FME), Jáchym Daniel (FA), and Ladislav Mošner (FIT).

All the participants were awarded special scholarships, given university promotional materials and provided with the chance to meet the rector, who assured them of his support and recognition.

(red)

## SPORTS



Photo Jitka Pešková's archive

### The Best University Athletes of 2015

The best university athletes were announced at an event organized by Masaryk University in Brno held on 1<sup>st</sup> December 2015. The BUT students receiving awards included Jitka Pešková in shooting, Michal Ondráček in baseball, and Jindřich Večeřa in athletics.

The ten best BUT athletes, ice hockey team, and eight crew met BUT rector Petr Štěpánek at the rector's office on 20<sup>th</sup> January to receive special scholarships.

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## EVENT



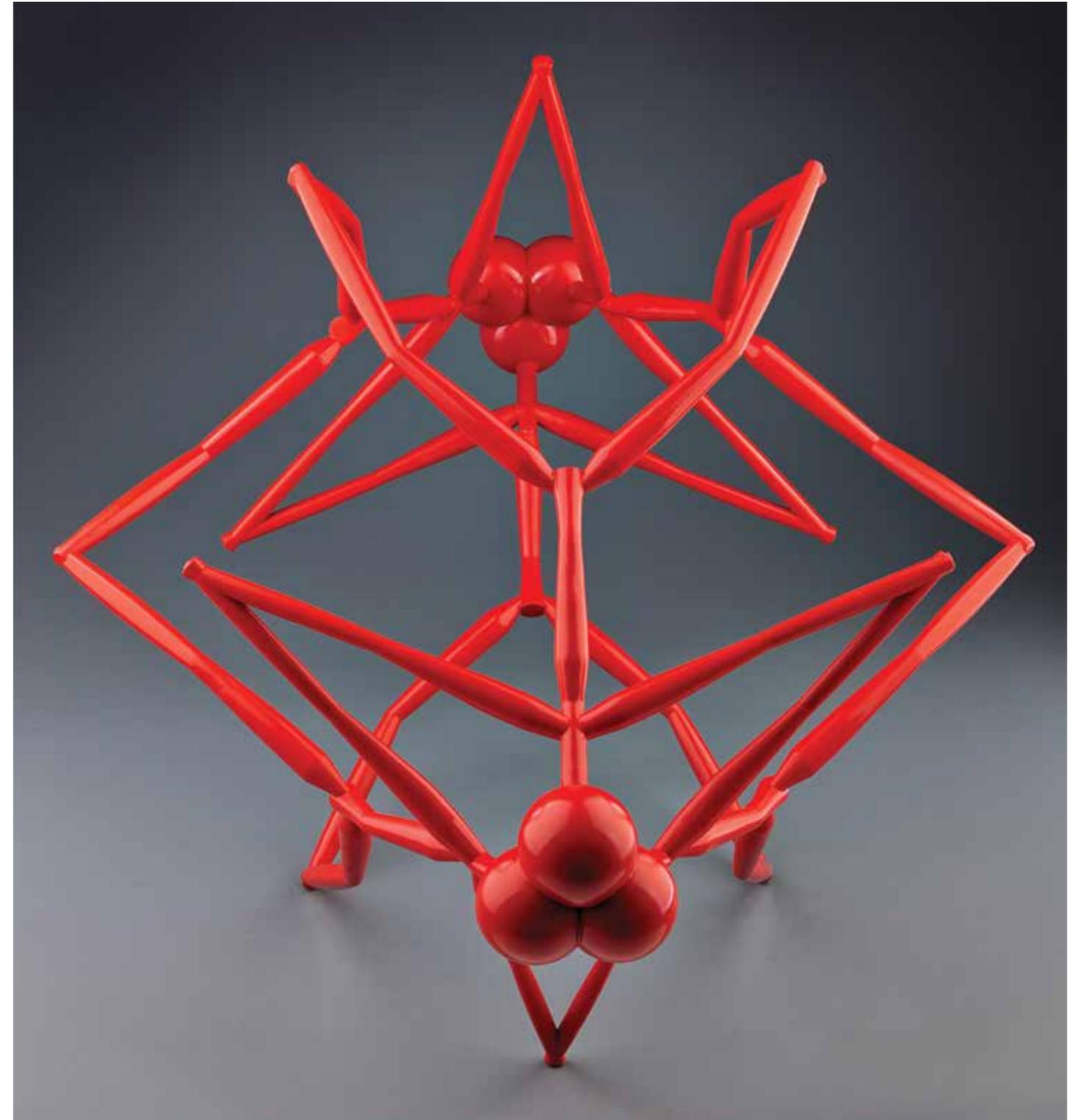
Photo Pavel Zemčík's archive

### Pavel Zemčík is the new FIT Dean

At its session of 24<sup>th</sup> November 2015, the Academic Senate of the BUT Faculty of Information Technology selected a candidate for being appointed dean from 2016 to 2020. The winner was Pavel Zemčík from the Department of Computer Graphics and Multimedia, who had been a vice-dean for external relations.

"In my opinion, the faculty has been managed well and right now it is neither necessary nor reasonable to make any major changes. Still I would like to place more emphasis on some faculty development areas such as internationalization, support for student activities, and improved cooperation with the industries," said Pavel Zemčík. "I believe that the faculty provides its students with good education, conducts top research and, last but not least, has a terrific campus. I think that it has a good reputation both among the students and the study candidates, although this is exactly what needs our constant attention," added the new dean, who assumed office on 16<sup>th</sup> January 2016.

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At the **Digital Exchange** exhibition in the Municipal Gallery in Trutnov, visitors could admire the works of art of the Sculpture I studio of the BUT Faculty of Fine Arts. An outcome of cooperation between the faculty and the **School of Visual Arts in New York**, the project presents 3D printing as a new technological phenomenon.

At the GAUDEAMUS education fair, you could also find the award-winning stand of Brno University of Technology, which won second prize in a competition for the best exposition.

