

BME NEWS



Alumni Barbecue

For the first time in the history of the Biomedical Engineering Master study course there was an alumni only meeting: time for sharing memories.



On the first Friday in September, the Club invited all alumni – Master and PhD – for an Alumni Grill Event to the new ARTORG building at Murtenstrasse 50 in Bern. For the 25 alumni that accepted the invitation, the evening started with Professor Lutz Nolte providing an overview of the ARTORG center, and outlining the changes regarding the Master course.

In the last few years, a lot has changed: to date, the Master course has three focus areas: Electronic Implants, Image-Guided Therapy, and Muskuloskeletal System. It also has an impressive number of students. At the beginning of the fall semester 2011, there were approximately 140 students in our program. The introductory talk was followed by a tour through some of the ARTORG labs for

those interested.

The ARTORG Center does not only host innovative scientists, however. The building itself is outstanding, too. That evening, we all benefitted especially from the breath taking view over Bern. An apero was offered on the roof deck of the building. This gave all participants the opportunity for catching up and talking about their careers. Later, the grill was switched on for the barbecue. Due to the warm evening, it was possible to sit outside even after sunset. With good discussions and one more glass of red wine, the evening slowly drew to a close. Rumor has it that BME alumni were seen in the bars downtown till dawn.

Text: Lukas Bösch

Photo: Tom De Bruyne

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Calendar



Swiss IEEE EMBS Chapter
www.biomedeng.org

Check out the IEEE web page for information about their guest lecture series. www.biomedeng.org



Visit the SSBE website for current activities and www.ssbe.ch

Get connected



“Those were good times,
the years in Bern.”

Albert Einstein

BME Club Visit to the RMS Foundation

A Link between the Industry and Academia

On November 4th, we had the opportunity to visit the RMS Foundation in Bettlach, a well recognized organization that works as testing laboratory and research institute in materials for different industrial applications, including medicine.

The group headed by Beat Gasser (Managing Director) has developed a highly specialized laboratory where it is possible to evaluate several physical and chemical characteristics of materials using equipments like X-ray Photoelectron Spectroscopy (XPS), X-ray Fluorescence Analysis (RFA), Infrared Spectroscopy (FTIR), and so on. It was awesome to see all these measurement devices far away from the books and realize all their applications, understanding the importance of carrying out these tests to predict or analyze failures, side effects, and ensure the quality and safety of the materials.

Besides, in the laboratory they make mechanical and technology tests, employing different equipments. One of the most impressive ones is a simulator used to test the wear-resistance relation of new materials developed for hip implants, in order to reduce the bone reabsorption caused by the friction in the joint. The machine is able to simulate the movements of a patient during a certain period of time. It can be shown that during 5 to 10 years of lifetime, about 5 to 30mg of Polyethylene material is removed. This amounts to approximately 1 million particles per step! Therefore, it is clear that there is still a lot of engineering

work to do to continue improving the materials' properties.

Their work as a research institute is not less impressive. Covering the investigation areas like bio-mechanics, tribology (interacting surfaces in a relative motion), skeletal substitute materials, tissue engineering etc. allows them to continue improving the performance and characteristics of the materials for technical and especially for medical applications. An important highlight is their cooperation with the universities and research groups around the world. They create a link between the requirements from the industry to the developments carried out at the education centers, allowing the spread of knowledge and its applications.

After the visit, the RMS Foundation organized a nice apero. It was an excellent opportunity for us to share ideas, ask about the future projects, and learn more about the team that is part of the foundation. We are grateful to the RMS Foundation for this invitation and to the BME Club for organizing this visit. That allowed us to realize how technology and research are cornerstones of improving the quality many patients' lives. Furthermore, it helped us to see the importance of understanding the problems that we should focus on today so that we will be able to develop effective and efficient solutions for tomorrow. There are still many things to do and it is a call to start to work together and be an active part of this scientific development.

Servo-hydraulic 6- Stations Hip and Spine Simulator



External view of the simulator



Internal view of the simulator

Text: Diana Catherine Peña Bello

Photos: RMS Foundation

CTI MedTech Event 2011

Bern Today, Lucerne Tomorrow

In the warmth of the late Bernese summer, the Commission for Technology and Innovation (CTI) hosted the yearly CTI Medtech event, where scientists, entrepreneurs, companies, and investors met in an intense program for an overview of interdisciplinary projects, an outlook on the future trends and initiatives, and most importantly for a glimpse at upcoming innovations. As in the previous years, the members of the BME club attended the event to establish new contacts, enlarge the BME club network, learn about new technologies, and meet with alumni colleagues; many now working for biomedical companies or pursuing research projects at different Swiss universities.

Following the welcoming notes and upon learning that the Swiss medical technology sector still remains at the leading position worldwide, the three nominated projects were presented. It was amazing to see how these presentations evolved with the evolution of available technologies - from more and more sophisticated power-point presentations only a few years ago, to very elaborate video presentations showing the audience all the important advantages of the particular project and product with the style of a professional TV show. A project by Aimago and EPFL "Measuring blood flow" showed how dermal blood flow can be visualized on skin burns to more precisely determine the level of injury and allow faster and more effective treatment. Combining electronic and optical expertise, employing Laser Doppler Imaging (LDI) and 20'000 images per second, EasyLDI can assess 7x7cm surface with 1-2mm penetration. In addition to skin burns, in the near future this technology will be used for precise removal of skin cancer, in neurosurgery, and in diabetes. The second project applied knowledge from the hearing implant in developing new means for dialyses, currently affecting two million people worldwide. To avoid multiple punctures of the skin or high risk of infection related to venous implants, the Nephrology clinic from Inselspital teamed up with Cendres+Métaux to create an implant anchored to the cranial bone behind the ear with a catheter inserted into a vein in the neck area. A project was described as "Thinking outside of the box". The third project, entitled "Practice makes perfect" demonstrated construction of a functional prototype of a knee simulator, developed by VirtaMed and ETH Zürich as a training device for arthroscopy procedures. This project won the best poster award last year. The audience felt somewhat surprised to learn that currently orthopaedic surgeons



learn to perform arthroscopy procedures directly on patients; not really a comforting thought. Watching a medical doctor undergoing training with a knee simulator fully resembling a human knee seemed more reassuring. Finally, although all the projects offered interesting new products, upon audience voting EasyLDI won the 2011 CTI award.

Among 67 poster award nominees, the CTI Best Poster Award 2011 went to the team of Professor Caversaccio of the University of Bern's ARTORG Center for their "High Precision Robot" project, an approach combining robotic assistance and image guidance for high precision surgery.

The round table, moderated by the head of the CTI, Lutz Nolte, discussed a controversial topic of "Tissue engineering and Regenerative medicine - science fiction or a truly awesome opportunity?". Starting with a challenging question - There has been so much investment into the field of cartilage tissue engineering, yet no satisfying solution has been found, why? The experts from companies and hospitals tried to provide potential reasons. An example, contrasting cartilage, was mentioned: a tissue engineered solution for heart valves in children, which has proved successful and is today present on the market. It was emphasized that the development, however, lasted much longer than initially anticipated, indicating that the cell-based technologies require extraordinary patience and investment in time and money.

The high value of the Swiss franc caused quite a disturbance in the Swiss economy this year, and the measures to assist Swiss life sciences projects and export-oriented companies were presented and discussed in the speech of Walter Steinlin, CTI President. Mr Steinlin also presented the new instruments of the



Visit our BME booth!

World Medtech Forum Lucerne

September 25 – 27, 2012

Messe Lucerne, Switzerland

CTI with the goal to keep the leading Swiss position in the world of medical technology and to keep and offer jobs in the biomedical sector.

This year featured the appearance of the federal Counselor Johann Schneider-Ammann, who recognized the success and importance of CTI Medtech initiative and who presented the three Innovation vouchers worth CHF 350,000 and CHF 330,000 respectively, to the companies Philochem, Compliant Concept, and Lonza.

With the growing number of participants reaching 550, coffee and lunch breaks saw a buzzing crowd around posters in all corners and rooms of the Bern Kultur Casino. Realizing that the venue grew simply too small, the next CTI MedTech event in 2012 will take place after the first World Medtech Forum in Lucerne. CTI Medtech event thus takes a new step in a new town and a new venue. We are looking forward to it all!

Text: Dobrila Nesic

Photos: Tom De Bruyne

Welcoming New Students

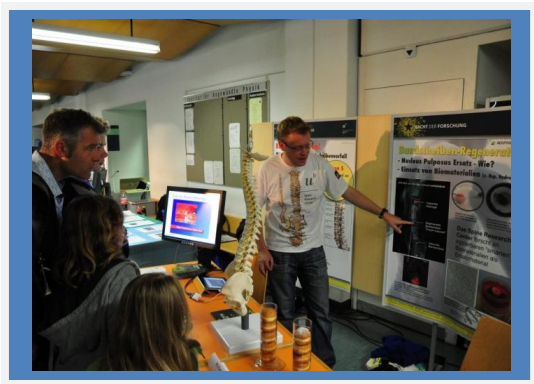
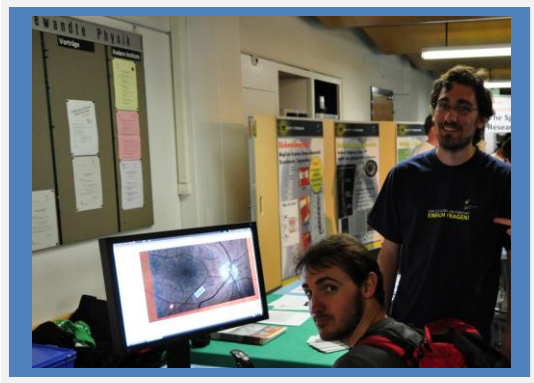
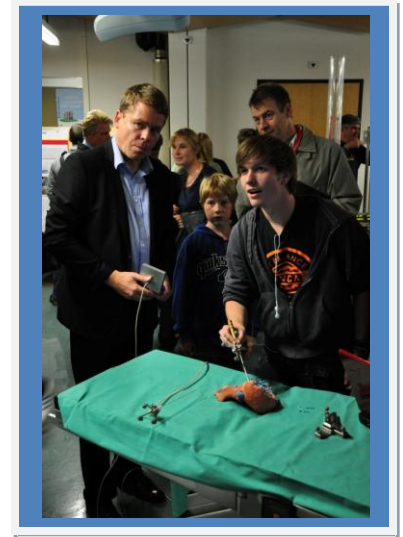
The First Semester picture at “Alter Hörsaal der Anatomie” has become something of a ritual.



“Nacht der Forschung” at the University of Bern

On September 23, 321 universities in 32 European countries opened their doors to the public following the idea of the Ministry of Research of the European Commission. The aim was to promote an exchange between science and society. The University of Bern was the only Swiss University participating in this event. Approximately 7,000 people accepted the invitation in Bern.

The pavilion of Medical Technology at the Institute of Exact Sciences was one of the most visited that night. All the research units from the ARTORG Center -Artificial Hearing, Artificial Kidney, Cardiovascular Engineering,



Computer-Assisted Surgery, Diabetes Technology, Gerontechnology and Rehabilitation, Lung Regeneration Technology, Ophthalmic Technology, and the Spine Research Center - presented their projects.

The visitors were able to ask questions directly to the researchers. Adults and children participated in all kinds of interactive activities at all the booths.

Get a glimpse of what the ARTORG researchers did:

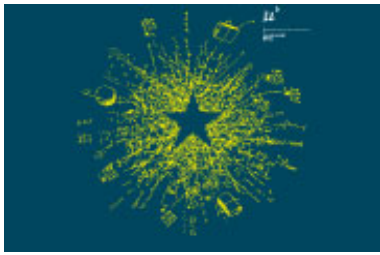
At the Cardiovascular booth, the visitors could push a balloon and try to equalize the quantity of blood ejected by the heart, realizing how strong it is.

The unit of Computer-Assisted Surgery put on display the robot for ear surgical procedures and the instrument guidance system for liver surgery. It was impressive to see how the liver can be visualized on a 3D screen and how the inner structures of this important organ are observed by the surgeons.

The group of Gerontechnology and Rehabilitation had a hands-on application in Matlab where the users could drive a car in a simulation. They had to try not to touch the different obstacles. A ranking between the players was made and the visitor with the least points won a price.

The Ophthalmic Technology group had prepared a competition as well. Visitors were asked to test the navigation system for retinal laser surgery. They had to navigate the joystick to different fixed points, competing with a computer that performed the same task.

The Spine Research group presented their project about biomaterials for intervertebral discs. They showed in a very practical way - with doughnuts - how liquid could be injected into it.



It was a great event for visitors as well as researchers. The research projects were successfully shared with an interesting crowd. We are looking forward to the next Night of Research.

Text: Lilibeth Salas Tellez

Photos: Jochen Walser

BME Club Events 2012

Outlook

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| January 10: | Stammtisch at Rest. Beaulieu, Bern |
| February 9: | New Year Reception BME Lecturers, Le Locle |
| March 6: | Stammtisch at Rest. Beaulieu, Bern |
| May 8: | Stammtisch at Rest. Beaulieu, Bern |
| May 12: | Grand Prix, Bern |
| May 25: | BME Day |
| May 25: | General Assembly |
| June 28: | Public Viewing Semi-final Football EURO 2012 |
| July 10: | Stammtisch at Rest. Beaulieu, Bern |
| August 25: | Hiking into the Bernese Uplands |
| September 7: | Alumni Barbecue |
| September 11: | Stammtisch at Rest. Beaulieu, Bern |
| September 14: | Welcome Event for Freshers |
| September 25-27: | Trip to World Medtech Forum, Lucerne |
| October 9: | Swiss Bowling Night at Rest. Beaulieu, Bern |
| November 13: | Stammtisch at Rest. Beaulieu, Bern |
| November 14-17: | Trip to MEDICA and Compamed, Düsseldorf |

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