



SNI update October 2014



Words from the Editor

Dear colleagues

The semester has started and our hallways have become lively again. Every year, it is a pleasure to see the new young and motivated students who fill our lecture rooms. A good introduction to the new semester was our first Annual Event that took place beginning of September at Lenzerheide. We experienced two successful days with some excellent lectures and numerous stimulating discussions. Many of our PhD students gave excellent speeches and I am glad to see that they are already working at a very high level. The organizing team did a great job, chose a nice venue and thought of

everything. From my point of view, the meeting was a great success and it supported our goal to raise a common SNI spirit and to create a SNI community. We have therefore decided to keep the venue and to organize the Annual Meeting 2015 again at the Schweizerhof in Lenzerheide.

For most of you, the meeting was also a good opportunity to get to know our new team member Claudia Wirth. Claudia joined the Swiss Nanoscience Institute in early September. She replaces Audrey Fischer and has already started to deal with SNI finances, human resource matters, and other administrative tasks. She completes the SNI management team and in this issue of *SNI update* you can get to know her a bit better.

We all know that SNI research is not only successful and diverse but also beautiful. This year's Nano Image Award contest demonstrates that clearly. We have received a number of amazing pictures from the nanoworld and it was not easy to choose the three winners. Now, I am glad that we can

congratulate the winners Celestino Padeste, Kishan Thodkar, and Patrick Shahgaldian to their beautiful nano images.

Chinese children experienced just how fascinating and beautiful the nanoworld can be during the Beijing Science Festival. Meret Hornstein and Florian Dettwiler represented the SNI and participated with an exhibition and interactive program. The Basler Zeitung published a long article on the SNI contribution. Currently, the SNI team is engaged in another Science Festival - the Science Days at the Europa-Park. Since many years, the SNI participates in this event where children from the region experience science in an interactive and entertaining way.

Now, I wish you a pleasant fall and remain with best regards

Director Swiss Nanoscience Institute, University of Basel

Coverstory

A great start – the first Annual Event of the SNI

From September 11th to 12th, the first Annual Event of the Swiss Nanoscience Institute was held at Lenzerheide. During seventeen scientific presentations and the postersession, the 75 participants got a good insight into the diverse and highly topical research at the SNI. Furthermore, the meeting offered an excellent occasion to exchange ideas and thoughts with colleagues from various disciplines and different SNI network partners.

Professor Christian Schönenberger opened the meeting with a brief review of the history of the SNI that emerged from the NCCR Nanoscale Science and was founded in 2006. In 2013, the NCCR Nanoscale Science came to a close and since then the SNI has been standing on its own two feet. Therefore, this year's meeting was the first under the sole sponsorship of the Swiss Nanoscience Institute.

Interdisciplinarity – a challenge for all

In his introduction, Christian Schönenberger emphasized how important and challenging interdisciplinary meetings are. All participants have to adapt the level of information and detail for talks and posters so that colleagues from other disciplines can benefit as well as colleagues coming from a related field.

Almost all the excellent speakers achieved this. Many attendees particularly liked the presentation of

Benjamin Bircher, who won the *Best Talk Award*. Benjamin Bircher is working on his PhD in the Argovia project NoViDeMo. During his talk, he managed to convince everybody in the audience that fluidity measurements are suitable for the determination of various chemical and biological properties of liquids. In his 20-minute presentation, he also impressively demonstrated why it is so difficult to get ketchup out of the bottle and how ketchup stains can make a presentation visually appealing. Other doctoral students who are enrolled in the SNI PhD school also nicely presented their plans and first results.

Exciting presentations – everyone takes something home

Arne Barfuss, for example, taught everybody in the audience that diamonds are perfectly suited for cutting ice and, in his research, also can be used as sensitive sensors. Sensors were also the keyword in the lecture of Ralph Stoop. The SNI PhD student investigates silicon nanowires for biochemical analyzes. First, he focuses on different chemical compounds. Later, he will also study proteins. Proteins of individual cells are the target of Stefan Arnold's research. He develops new methods that only need minimal amounts of material to investigate and compare the protein composition of individual cells. With these analyses, the researchers hope to gain a better understanding of various diseases. Other new methods for the study of tiny objects were presented by Michael Gerspach. The SNI PhD student demonstrated in short films how he is able to capture individual nanoparticles for further analyzes using electrostatic forces. New materials are in the focus of Peter Makk. He works with graphene that was first produced in 2004. In his presentation, he descriptively showed how the thin graphene layers can be suspended above metallic gates and how their examination lays the foundation for the use of their unique electrical properties.

Targeted synthesis – getting better through teamwork

Not only PhD students provided fascinating insights into their research but also the two invited speakers Professor Marcel Mayor and Professor Rodrick Lim



shared their success stories. Marcel Mayor showed in his presentation how, nowadays, chemists produce molecules with specific properties using synthetic chemistry. Inspired by colleagues from other disciplines who look for molecules with specific characteristics, chemists can produce molecules that fulfill certain tasks. They produce, for example, compounds that specifically self-assemble on surfaces or emit light after a specific reaction. The chemists always work closely together with other experimental groups to get feedback on the molecular properties and to become even better in designing molecules with pre-defined characteristics.

Understanding nature – models help

The Argovia professor Rodrick Lim with his team follows a totally different path as he deals with a natural system that optimally functions and that he aims to understand. Lim studies the transport of macromolecules

into and out of the nucleus through the so-called nuclear pore complexes. He recently published a hypothesis suggesting that in these pores an effect appears that can be compared with dirty velcro with lots of adhering particles. These particles can be compared to the macromolecules that are transported: the larger the number of macromolecules, the weaker the binding to the pore and the faster the transport - the smaller the number of molecules, the stronger the binding and the slower the transport.

SNI Network – enrichment for all

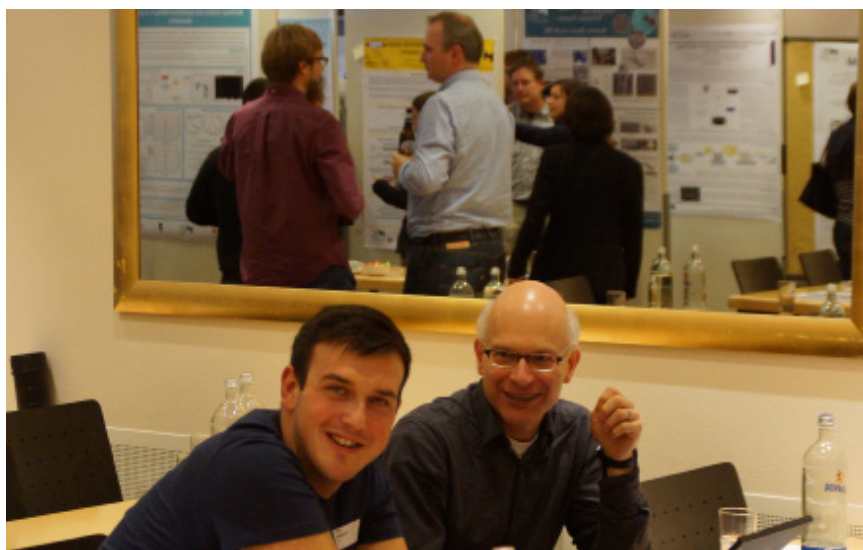
The two days of the meeting were also enriched by the presentations of project leaders from the various SNI network partners. Professor Per Magnus Kristiansen (FHNW) presented his Argovia project PATCELL that aims to improve implants. Professor Patrick Shahgaldian talked about the Argovia project NANOzyme that investigates the combination of artificial and natural enzymes. Additionally, researchers from the groups of the SNI Honorary Professors Thomas Jung and Frithjof Nolting from the Paul Scherrer Institute in Villigen as well as representatives of other Argovia projects were among the speakers.

Poster Session – nice combination of discussions and apéro

Some deeper discussions were possible during the postersession that was combined with an apéro and took place on the first day after the presentations. Strengthened by specialties from Graubünden and a glass of juice, wine or beer, all participants actively discussed the topics exhibited on the 30 posters. Here as well, everybody tried to get a good overview of the various presented projects as participants could vote for the best poster. Hans-Peter Lang scored the best and won this award with his poster on the electronic nose. The electronic nose



Rodrick Lim explains his hypothesis.



Lively discussions took place during the postersession.



During the SNI Annual Event, participants not only discussed science but also had fun.



is one of the projects from the first days of the SNI. It is based on a cantilever test system that analyzes tiny traces of different substances in the human breath. These results give indications of different diseases.

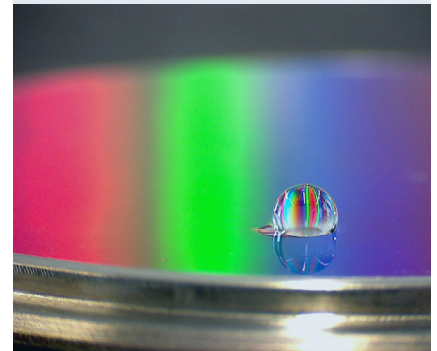
The lively discussions in front of the posters went on until the evening program started and continued during dinner. In between, one could also hear great praise for the excellent cuisine of the Schweizerhof. So a few of the PhD students would rather have preferred to stay in the warmth than to leave for their evening program. Although some may have got cold feet, the night fishing combined with a hike and some hot wine punch provided a funny balance to science.

This first Annual Meeting of the SNI was a success as many participants confirmed. In his closing words, Christian Schönenberger therefore thanked the two organizers Sandra Hüni and Meret Hornstein and gave an outlook for coming events and activities of SNI. Due to the consistently positive echoes, the SNI management has decided right after the meeting to organize the Annual Meeting 2015 at Lenzerheide again.

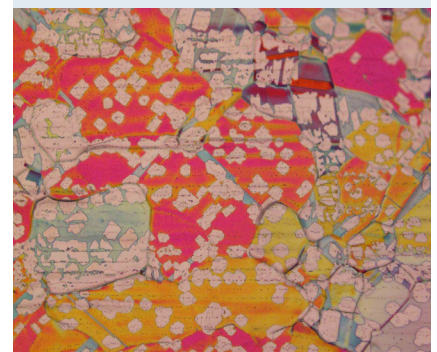
Congratulations to the winners of the Nano Image Award 2014

The winners of this year's Nano Image Award are:

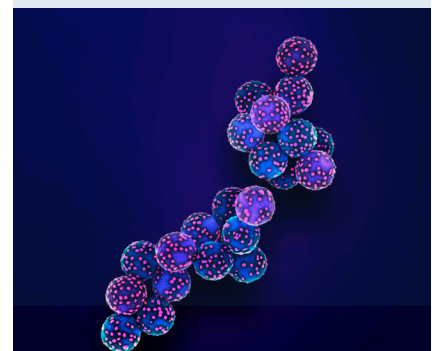
Celestino Padeste (PSI)
We caught the rainbow



Kishan Thodkar (University of Basel):
Graphene Mosaic



Patrick Shahgaldian (FHNW)
Virus imprinted particles



We introduce ...

Claudia Wirth, the new colleague at the Swiss Nanoscience Institute

If SNI members are looking for support in financial, human resource or administrative matters, again they will find a competent partner. In September, Claudia Wirth has moved into her office on the 4th floor of the Physics Department and rapidly made the SNI Secretariat the primary point of contact for a wide variety of SNI matters. Her goal for the new job is to always have an open door and to try to find a good solution for each kind of issue. Claudia is looking forward to dealing with many different people and questions. She tries to follow the principles of the actor, writer and director Georg Tabori, who described himself as a “playmaker” and who obviously has achieved to get the best out of everybody by his quiet and relaxed behavior.

Claudia came to the SNI from the Institute of Retail Management (IRM) at the University of St. Gallen. After four years at the IRM, she had decided earlier this year to look for a new challenge and this should be in her favorite city Basel. In the past, Claudia has already lived in Basel and she likes the nice atmosphere and the open and friendly people. So in May 2014, she was very motivated when she first came to the SNI for an interview marathon. While for other candidates the seven interviews in two hours were very stressful, Claudia flourished. “It was perfect for me to get to know the whole SNI-Team during these two hours”, she remembers. “It was also a



You can be sure to get a smile when you enter Claudia’s office.

bit funny because it reminded me of speed-dating”, she laughs. Relaxed, open, communicative and goal-oriented – this is how Claudia presented herself to the SNI management team and thus convinced everyone.

Jump into the deep end

On September 1st, Claudia took up her new position at the SNI and immediately was involved in the organization of the SNI Annual Event. So, her desk stayed empty for some more days and she took the opportunity to personally get to know many new colleagues and SNI members at Lenzerheide. “It was very nice to experience the relaxed atmosphere right at the start and I was really impressed by the quality of the presentations.”

During the meeting, Claudia felt a bit like being carried back to school days. She was glad that she still remembered a lot from her chemistry classes and that she was always interested in natural sciences. However, she did not follow this interest when she had finished school but chose Germanic studies instead. In 1987, she graduated with a thesis in computational linguistics and subsequently worked at the Fraunhofer Institute for Industrial Engineering in Stuttgart. She was planning to do her PhD thesis there. However, it turned out differently and Claudia spontaneously decided to apply for a position as Marketing Executive for Computer Science at the Springer-Verlag. At the beginning, the three years at Springer were not easy but Claudia gained valuable life experience. She got to know that nothing can blow her away easily and that she can achieve

Symposium in memoriam Professor Hans-Joachim Güntherodt

On 27th November, a lecture program in honor of our founding father Professor Hans-Joachim Güntherodt will take place. Friends, students and colleagues of Professor Güntherodt will remember him with their contributions. You are cordially invited to participate. The event will take place in the large lecture hall at the Department of Physics, St. Johans Ring 25 from 9.30 until 18.00.

There won't be any other lectures at the Department of Physics during that day.

Please find the full program at:

http://www.nanoscience.ch/nccr/agenda/agenda_autofiles/141016080724-SymposiuminmemoriamProfessorHans.pdf

her goals with empathy, patience and persistence. In the following years, she worked with different publishers in Germany and until mid 2002, she was Sales and Marketing Director of Lexika in Würzburg, Germany.

From Publisher to University

In the meantime, Claudia's husband had received his PhD from the ETH Zurich and subsequently had found a permanent position in Basel. So, she planned to follow him to Switzerland. She looked for a job and found it at the University of Zurich. Until 2010, Claudia worked there as Science Manager at the Artificial Intelligence Laboratory (AILab) and as Head of Employment Services at the Zentralstelle der Studentenschaft. Asked if she missed the marketing aspects after having changed from her previous position to the university she replies: "Marketing is a way of living. In every position, I can be a marketer. If, for example, I am conducting a job interview, I crucially influence the relationship with the employer and

that is an important form of marketing as well."

Claudia pursued this philosophy during her time at the University of Zurich and subsequently also at the University of St. Gallen. In her new position at the SNI as well, she is particularly looking forward to working with different people of all ages and nationalities. Already in her first weeks, she enjoyed being confronted with researchers from natural sciences who, according to her judgment, differ in their way of thinking, their problem solving behavior and their ability to abstract from other scientists with whom she had worked in her previous job. Claudia is also fascinated by the diversity of the SNI research topics and the interdisciplinarity within the projects. "I had a great start here and look forward to the work that lies ahead," she comments.

Culture is at the top

Claudia is also happy to be back in Basel, because the atmosphere and the

attitude towards life in Basel appeal to her a lot. On weekends, however, her house full of books and her seasonal theatre and concert tickets drag her back to St. Gallen. She is interested in any kind of culture, has a passion for music - from Mozart to Die Toten Hosen, owns the Swiss and the Upper Rhine Museum Pass and regularly goes on city trips to specific art exhibitions. From all the cities she has visited so far it is Tokyo that, besides Basel, lies at her heart. She is fascinated by the contrasts this city has to offer: the crowds of people on one street, the tranquility at a Buddhist cemetery just around the corner, and the relaxed coexistence of tradition and modern life. Claudia has travelled to Japan several times and is still enthusiastic and impressed by the country. "I become unbearable if I do not regularly go to Japan", she admits. That's good to know. Because when Claudia does not smile if we enter her office then we know that she needs a holiday in Japan.

SNI Lecture

The Swiss Nanoscience Institute is pleased to invite you to the 1st SNI Lecture held by Prof. Jan Liphardt, Stanford University.

25 November 2014, 17:15

SNI Lecture
held by Prof. Jan Liphardt
Stanford University

Department of Chemistry
Small lecture hall, Organic Chemistry
St. Johans-Ring 19

Colloquium followed by an Apéro

Professor Liphardt leads a biophysics lab at Stanford University. He investigates biological spatial organization on the mesoscale and the role of mechanical cues in cellular decision-making.

News from the SNI

Survey *SNI update*

During the SNI Annual Event, we conducted a short survey on the newsletter *SNI update* among the participants. About one third of the attendees filled out the form. All of them stated that the information in the newsletter is at least partially interesting, with the cover story, the portrait and the news being the parts that raise the highest interest. About two thirds read the English issue, preferably the pdf version. As one fourth prefers the online version, we will still continue to offer this form. The German version will also be continued as this is predominantly read outside the scientific community.



The SNI booth was always crowded.



Events

The SNI at the Science Festival in Beijing

Meret Hornstein and Florian Dettwiler represented the Swiss Nanoscience Institute at this year's Beijing Science Festival in September. During one week, the two nano scientists were up and about in order to share the fascination of nanoscale science with Chinese children. As at previous science festivals, the SNI booth was crowded all the time because Meret and Florian did not just offer information but invited the kids to become active

themselves. They could build nano cars out of small vibration motors and tooth brushes, create amazing shapes with ferrofluids or play with the computer simulation of a scanning probe microscope. Being back in Basel, Meret commented: "It is important for the SNI to participate in events like this because there we can raise the interest in natural sciences among children. Additionally, it is an excellent opportunity to further expand the SNI network and to make the SNI visible outside Northwestern Switzerland.

The Basler Zeitung reported in detail on the planning of the SNI activities and the Beijing Science Festival.

Articles in German can be found at: <http://bazonline.ch/basel/stadt/Eine-gut-geplante-Reise-ins-Ungewisse/story/20178233>

News from the nano studies

Workshop at the CSEM

More and more SNI network partners contribute to courses for the nano curriculum. Martin Stalder from the CSEM in Muttensz, for example, guided a mini workshop for nano students during the summer break. During the course, the students built nano lenses for smartphones using off-the-shelf materials and were able to make remarkable images. If you also would like to offer courses for nano students please contact: katrein.spieler@unibas.ch.

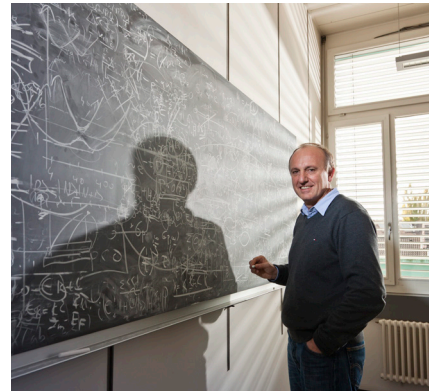


Awards

Professor Daniel Loss received the Blaise Pascal Medal in Physics

The European Academy of Science awarded Professor Daniel Loss from the University of Basel with the Blaise Pascal Medal in Physics in recognition of pioneering contributions to theoretical condensed matter physics, in particular work on spin-dependent and phase-coherent phenomena ('mesoscopics') in semiconducting nanostructures and molecular magnets, and application to quantum information processing.

More information at: http://www.eurasc.org/medals/pb_medals_14.asp



Press releases and uninews from SNI members

Universität Basel, 26.09.2014. Four new professors at the University of Basel

The University Council has selected Prof. Andreas Zeller as Professor for General Practitioner Medicine and Prof. Philipp Habegger as Professor for Mathematics. New Assistant Professors will be Prof. Tania Rinaldi Barkat for Neurophysiology and Prof. Jelena Klinovaja for Physics.

University of Basel, 22.09.2014. Uncovering the forbidden side of molecules

Researchers at the University of Basel have succeeded in observing the "forbidden" infrared spectrum of a charged molecule for the first time. These extremely weak spectra offer perspectives for extremely precise measurements of molecular properties and may also contribute to the development of molecular clocks and quantum technology. The results were published in the scientific journal Nature Physics.

Did you know, that...

... an exchange program exists between the University of Basel and South Africa? In the current phase of the program projects in nanoscale science are supported among others. Students as well as staff members can submit applications.

More information at: <https://globalaffairs.unibas.ch/joint-programmes>

**University of Applied Sciences Northwestern Switzerland,
17.09.2014. Successful cooperation of the University of Life Sci-
ences FHNW with the University of Basel in nanotechnology**

Currently, a PhD thesis at the University of Basel is lead by a professor of the University of Life Sciences FHNW. During the thesis, a novel sensor system based on diamond nanostructures will be developed.

**University of Basel, 16.09.2014. Insights into quantum dots thanks
to novel nano-MRI**

Physicists of the University of Basel and the Swiss Nanoscience Institute have developed a Magnet-Resonance Imaging Microscope (MRI) that is much more sensitive than previously know devices. While these require at least 10 quadrillion atoms to image detailed structures, the new microscope is able to detect one thousand atoms. It can be used to analyze tiny quantum dots and to manipulate electron spins and herewith opens new ways to a better understanding of the quantum world. The scientists from Basel recently published these findings together with researchers from the University of Bochum in «Nature Nanotechnology».

**University of Basel. 25.08.2014. Kick-off NCCR Molecular Sys-
tems Engineering**

The new National Centre of Competence in Research in Molecular Systems Engineering officially announces the kick-off meeting to take place at the University of Basel on Friday, 29th August.

Full media releases can be found at:

http://www.nanoscience.ch/nccr/media/recent_press_releases

Please reserve the date

The next Annual Event of the SNI will take place from 3rd to 4th September 2015 at Lenzerheide. Please reserve this date.

