



University
of Basel

Swiss Nanoscience Institute



Swiss Nanoscience Institute
Center of Excellence supported
by the University of Basel
and the Canton of Aargau

Swiss Nanoscience Institute

The Center of Excellence
in Nanosciences and
Nanotechnology in
Northwestern Switzerland

Lipid nanoparticles in transgenic cells, Claudio Alter (University of Basel)

The Swiss Nanoscience Institute

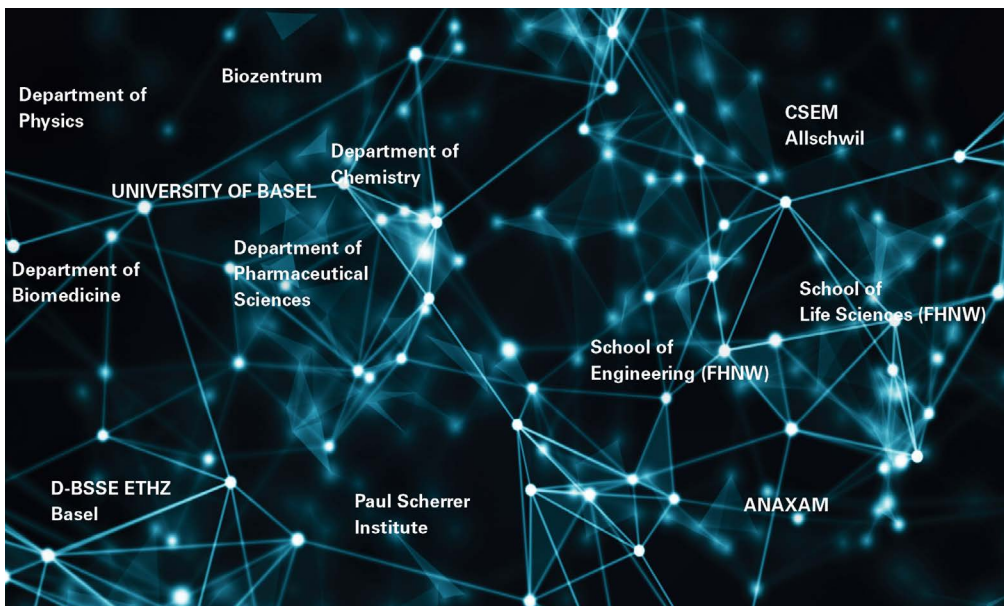
The Swiss Nanoscience Institute (SNI) at the University of Basel is a center of excellence for nanosciences and nanotechnology, founded in 2006 on the initiative of the Canton of Aargau and the University of Basel. In the SNI network, interdisciplinary teams of scientists conduct basic and applied research. Moreover, the SNI actively supports knowledge and technology transfer to industrial companies from Northwestern Switzerland through the Nano-Argovia program and is a founding member of the ANAXAM technology transfer center.

For companies and research institutions, the SNI's Nano Imaging Lab and the Nano Fabrication Lab offer comprehensive imaging, analysis and nano fabrication services.

The SNI offers not only a bachelor's and master's degree program but also a PhD School, providing interdisciplinary training to early career researchers.

Finally, the SNI is also involved in public relations, specifically supporting initiatives aimed at generating interest in the natural sciences among various target groups and promoting collaboration between academia and industry.

The SNI has an annual budget of about 7.25 million Swiss francs, of which 5 million come from the Canton of Aargau and 2.25 million from the University of Basel.

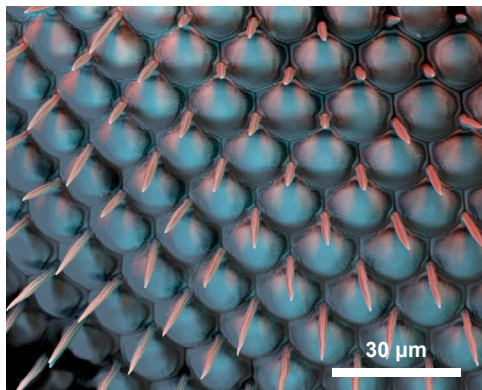


The interdisciplinary SNI network comprises leading research institutions in Northwestern Switzerland ensuring diverse and exciting nanoscience research. (Image: Shutterstock)

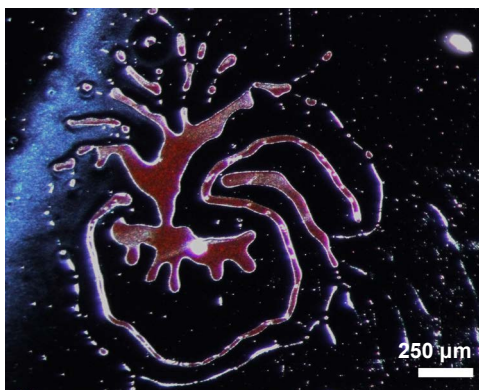
The Nanostudy Program – Excellent education for students

In 2002, the University of Basel – under the leadership of the SNI's predecessor institution – launched the Bachelor's and Master's degree programs in nanosciences. Today, this demanding degree program is firmly established.

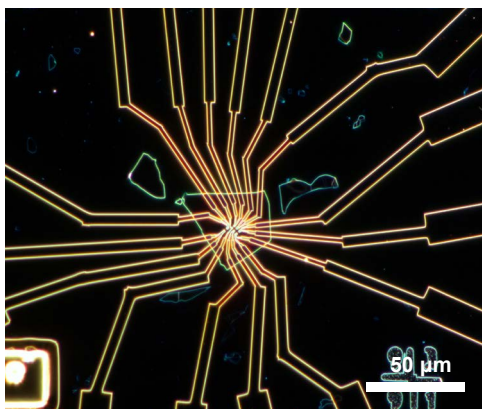
The students who begin the Bachelor's program receive a solid basic education in biology, chemistry, physics, and mathematics and can subsequently choose from a wide range of courses that allow them to focus on specific topics. Early on in their education, the students have the opportunity to participate in various research groups, an activity that always proves particularly motivating. The pictures below are contributions to the Nano Image Award by bachelor, master and PhD students.



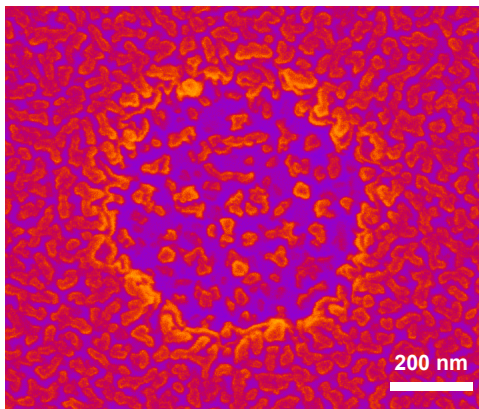
Compound eye of a *Drosophila melanogaster* making eye contact. (C. Mignani, J. Koehlin & Ch. Küng, University of Basel)



Nanometer-thin gold-silicone heterostructure. (T. Töpper, University of Basel)



Graphene on hexagonal Boron nitride flakes electrically contacted to perform electronic transport experiments. (M. Rehmann, University of Basel)

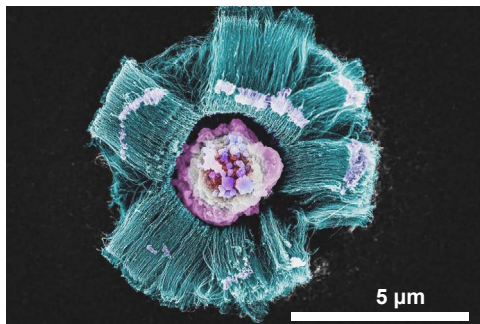


A nano pocket inside a nanochannel on a glass substrate. (D. Sharma, University of Basel)

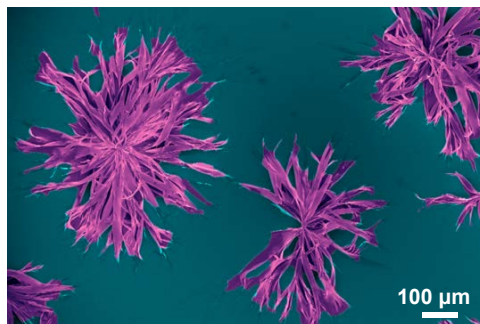
SNI PhD School – Attractive for graduate students from all over the world

To promote further training of young scientists as well as a wide spectrum of basic scientific research, the SNI initiated a PhD School in 2012. At the end of 2022, 33 doctoral students from 12 different countries were enrolled. They are working in different departments of the University of Basel and its partner institutions (FHNW, PSI, D-BSSE).

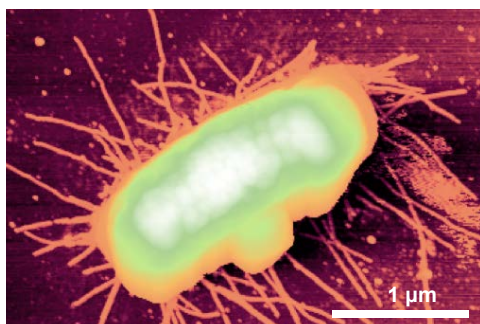
Within the SNI PhD School, each doctoral student is supervised by two members of the SNI network. They also become involved in internal events, such as the SNI Winter School and the SNI Annual Meeting, and take part in various courses to gain insights into areas such as intellectual property, communication and rhetoric specifically developed for the SNI PhD school.



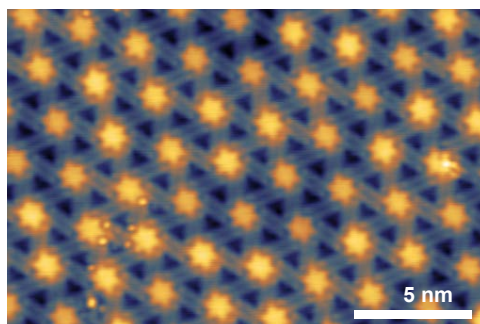
Carbon Nanotubes.
(D. Mathys, Nano Imaging Lab, University of Basel)



Colored SEM micrograph of flower-shaped like supramolecular aggregates of pyrene derivative.
(M. El Idrissi, FHNW)



The AM-AFM topography image of single *E. coli* bacteria positioned onto a mica surface. (M. Kisiel, M. Wasem and E. Meyer, University of Basel)

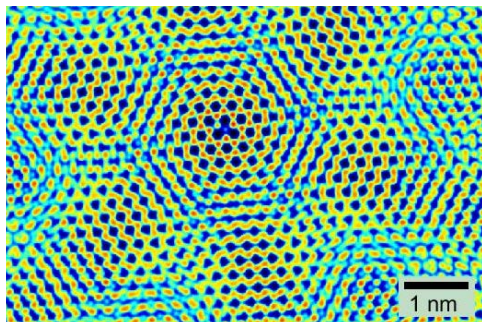


Star carpet. Self-assembly of HCB molecules on Au(111). (R. Pawlak, University of Basel)

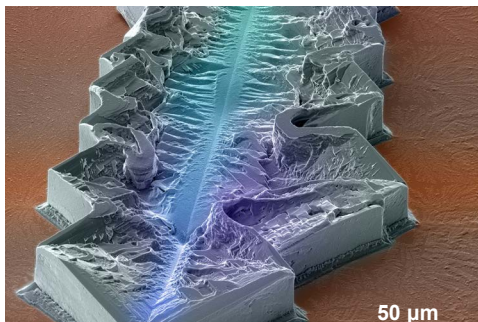
The Nano-Argovia Program – Successful Approach to Applied Research

Since it was founded, the SNI has placed great value on the transfer of academic findings to industry. To optimize this process, the SNI started an annual call for applied research projects. This program, entitled Nano-Argovia, supports up to 15 projects each year from a wide range of nanotechnology research topics in close collaboration with industrial companies in Northwestern Switzerland and has a total budget of around 1.5 million Swiss francs.

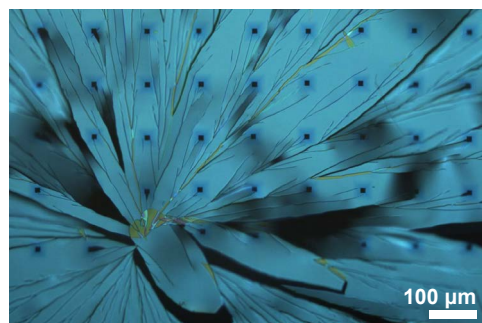
With the Nano-Argovia program, the SNI is building an important bridge between research and application. In several cases, this collaboration has led to Innosuisse and other follow-on projects.



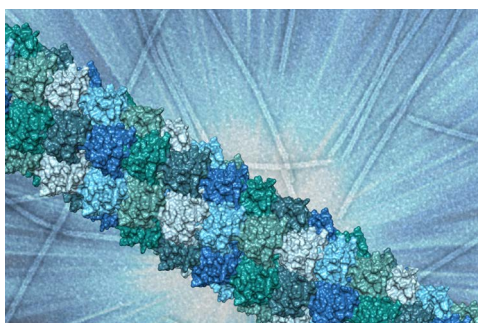
Periodic potential formed by a single layer of carbon atoms (Graphene) combined with two layers of boronitride. (A. Baumgartner, University of Basel)



Sodium chloride crystal.
(D. Mathys, Nano Imaging Lab, University of Basel)



Peacocks fan: A perforated 200 nm thick silicon nitride membrane that broke. (C. Padeste, PSI)



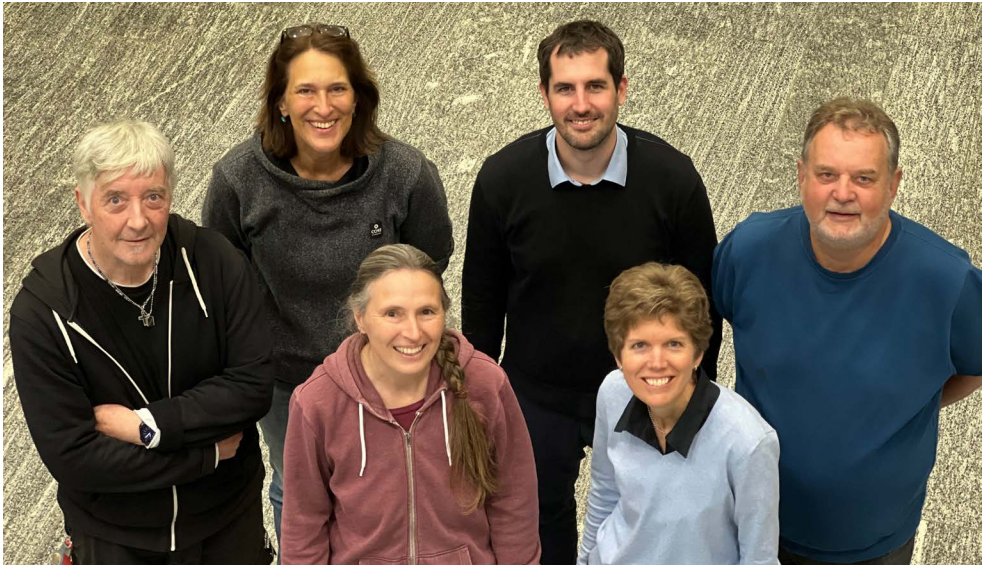
Atomic resolution structure of an ASC filament calculated from combined data of cryo-electron microscopy and solid-state NMR spectroscopy.
(L. Sborgi, University of Basel)

Nano Imaging Lab

The SNI also includes the Nano Imaging Lab (NI Lab), where six members of staff work to provide imaging services for research and industry.

The Nano Imaging Lab (NI Lab) has various scanning electron microscopes (SEM), transmission electron microscopes (TEM), and atomic force microscopes (AFM). It is also equipped with focused ion beam technology and confocal microscopes and can perform various spectroscopic analyses. Thanks to the excellent equipment available, the team is able to select the most suitable imaging technique and therefore to provide outstanding imaging services to customers from academia and industry.

These services include not only various sample preparation methods and chemical analyses, but also the production of attractive colorized images. In addition to research activities, the NI Lab team also plays an active role in training and outreach.



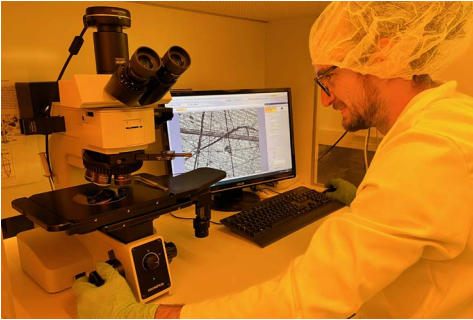
The NI Lab is a competent partner for analytical and imaging services (Daniel Mathys, Susanne Erpel, Evi Bieler, Marcus Wyss, Monica Schönenberger und Markus Dürrenberger). (C. Möller, University of Basel)

The NI Lab is a founding member of the microscopy network Northwestern Switzerland (NWCH) – a network of academic institutes in the field of nano-imaging.
www.microscopy-nwch.com



Nano Fabrication Lab

The SNI Nano Fabrication Lab offers the equipment, environment and experience needed for the fabrication and prototyping of State of the Art micro- and nano-devices used in fundamental and applied condensed matter physics. The high-end lithography, deposition, etching, post-processing systems and the clean room (CR) space allow the NF Lab users to routinely pattern and manipulate micro- (<100 μm) and nano- (<100 nm) scale metal, semiconductor and polymeric materials resulting in the outstanding nanomaterials and devices at the core of the SNI experimental research projects.



Gerard Gadea and Arnold Lücke from the Nano Fabrication Lab provide an excellent nano and micro fabrication service. (C. Möller, University of Basel)

Sharing the fascination with others

The SNI wishes to involve the public in its fascination with the natural sciences through active communication and participation in various events. For example, the SNI team is actively involved in science festivals and fairs both at home and abroad, provides schools and groups of interested visitors with an insight into everyday laboratory life, and strives to make scientific achievements accessible to a wide audience.



Children are intrigued by the Lotus effect at the SNI's booth at the Science Days Festival in Rust. (M. Wegmann, University of Basel).



The SNI informs pupils about studying nanosciences at the University of Basel. (C. Möller, University of Basel).

www.nanoscience.ch



Follow us:



**Educating
Talents**
since 1460.

University of Basel
Petersplatz 1
P.O. Box 2148
4001 Basel
Switzerland

www.unibas.ch

Swiss Nanoscience Institute
Klingelbergstrasse 82
4056 Basel
Switzerland

www.nanoscience.ch
outreach-sni@unibas.ch