



nanosurf

*Driving the Nanotechnology
Revolution for 25 years*

Spectra Research Corp.
Canada

Nanosurf
UK & Nordic



High-tech
im Hinterhof



Nanosurf starts in a garage: Robert, Lukas, Dominik

Several innovation awards for easyScan STM, AFM, PLL

STM for US educational program and start of industrial AFM versions

Nanosurf on Mars! successful landing with NASA Phoenix mission

1000th STM delivered to a School in Germany.

Urs Matter joins as CEO, stage systems for industry, Nao STM/AFM

1997

1999

2000

2001

2004

2005

2008

2009

2010

2011

2012

2013



easyPLL Controller



easyScan AFM



easyPLL Sensor Controller



Mobile S AFM system



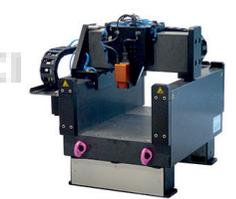
NaniteAFM



FlexAFM



LensAFM



First custom stage for NASA



NaoAFM

France Scientifique
FR

ANAMET Slovakia

Nanosurf Switzerland

Paralah



Move to larger premises, fully digital C3000 controller, cooperation for Fluid AFM

2013



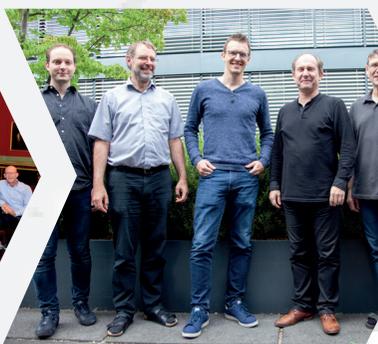
Unstopable growth: new products, new markets, new talent

2014



20 year anniversary and scientific symposium at Natural History Museum Basel

2016



The big guys: dedicated division for industrial solutions starts operation

2017



Extend software crew, CX controller, DriveAFM.

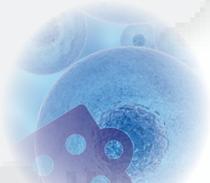
2018



Fresh wind for our management: James, Mathias, Dominik, Björn (left to right)

2019

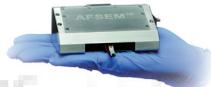
C3000 controller



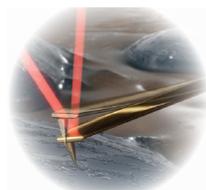
FluidFM



CoreAFM



AFSEM



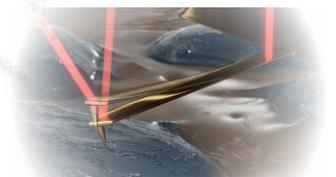
PicoBalance



Alphacen 300



DriveAFM



WaveMode

Nanosurf Singapore

Scitech Australia

How it all began

Telling the story of “how it all began” is not so easy. To best describe, let’s take a closer look at the serendipitous encounters that led to the foundation of Nanosurf.

Locally, our common beginning belongs to the magic triangle of Basel-Liestal-Dornach, two cities and a village in the northwest of Switzerland. They fit into a circle, 20 km in diameter, and yet they belong to three different cantons (states). The melting pot for our coming together was the University of Basel, more precisely, the Institute of Physics at Klingelbergstrasse 82, which housed the active research group of Professor H.J. Güntherodt. It also included an in-house mechanics and electronics workshop. At that time, this microcosm was very familiar and manageable, and its overlap into the world of scanning probe microscopy research was significant. The word “world” actually meant the whole world. For “Gü”, as we called our Professor, made it possible for his students to participate in global forums of many kinds. The melting pot on Klingelbergstrasse was thus our gateway to the whole world.

Nik, the youngest of the founding trio, was completing his apprenticeship as an electronics technician in the in-house electronics workshop. Afterwards he studied electrical engineering at the University of Applied Sciences in Muttenz. As a finished electrical engineer and specialist for digital electronics, he came back and worked at the institute.

Robi and Nik both lived in Liestal at the time and knew each other from their youth. Robi walked the same corridors as Nik as a physics student. He studied solid state physics and used AFMs to measure the surface structure of high temperature superconductors. In their spare time, the two ran a small business developing light controllers and other devices using a simple controller.

I (Lukas) studied solid state physics and developed a UHV-AFM for friction measurements on the atomic scale during my PhD thesis. Such devices could not be bought commercially at that time, and self-construction was quite natural. At that time, a lot of valuable experience had been accumulated in Ernst Meyer’s group and in the in-house workshops. These were the centers of competence which were utilized for the rich experience it offered.

So all three of us were working in the middle of a bubbling source of innovation, research spirit and engineering art. We often moved at the limits of what was technically and physically possible. The

epicenter of all activity was Gü, our professor. He was a real “enabler.” His positive and supportive attitude accompanied our independence in a wonderful way. He remains a role model for us today.

A first phase of entrepreneurship also occurred for me when the company Omikron Vakuumphysik showed interest in my UHV-suitable AFM. It was successfully commercialized in a slightly revised form. The reward at that time was a larger and more comfortable UHV chamber. It was encouraging to see that one’s own developments were also in demand outside the University of Basel. I therefore



started to build accessories for UHV microscopes. These were small positioners with piezo motors that also needed electronic control. Since I only knew analog electronics to some extent, we had to build the digital control for the motors. Thus began the collaboration as a trio.

The spark for a larger project then came from Heinrich Schenkel, an enthusiastic physics teacher from a nearby high school. He asked Gü for a discarded STM. The goal was for high school students to have direct access to the world of atoms in project work. Gü forwarded the question to us. “Us” at that time meant a loose community of engineers from the electronics workshop, including Nik and myself. A disused research system would have been

much too complicated and was not exactly sitting around. So we put together a first specification for a simple and robust STM. The vision of a product, a compact overall system, began to germinate at that time. Lukas built the first prototypes of measuring heads with simple and mechanically stiff piezo motors for actuating the highly sensitive measuring tip. But what should the electronic control of the device, including the operator software, look like? As a first step, the specifications for highly simplified control electronics were given to students of the University of Applied Sciences. They wanted to demonstrate the feasibility of the concept. However, this work

was not completed in the time available.

So, our trio was at a decision point. Either we personally immerse ourselves in this development adventure and pull it off ourselves, or we leave it alone and continue with our other activities. Nik and Robi were convinced that the processor platform they knew so well from their lighting controllers would suffice. All three of us decided to dive into this adventure! We had the technical experience of the research facilities in our backpacks. But with courage, we had to break a lot of new ground to turn the vision of the robust STM affordable for schools into a tangible product. Our startup story is not a typical spin-off where college graduates commercialize a university development. It took radically new ap-

proaches to the “easyScan STM” to become reality. This was our first product!

How did we come up with our name? At first, we named the project “Nanosurf” and at the time we intended to name our first device Nanosurf. But we soon realized that Nanosurf would be an even better name for the company. We therefore named the device “easyScan STM” and the company “Nanosurf”. And of course, after building an STM, it soon became clear that an “easyScan AFM” would have to follow, if we were to be seen as serious about this business.

As technicians and scientists, the commercial and entrepreneurial territory we were entering was very much uncharted. Right from the beginning, we were ready to be fully self-sufficient. It became clear, however, that we would have to rely on the additional knowledge and experience of active members in the Board of Directors. After a first «heroic» start-up we realized that growing a business needs the right people in the right positions. We hired and empowered enthusiastic and capable international employees who gradually joined us and took us forward in many new directions and toward new opportunities. In doing so, we cultivated an agile organization, fit to meet the challenges this niche market would present to us.

After 25 years, our headquarters and subsidiaries around the world continue to attract the best talent from across the globe. Nanosurf provides opportunities to be at the forefront of world-leading research across a diverse range of sectors. With our combined experience and technical creativity, we design, build, and support the world’s largest AFM systems, using the latest and most innovative technology of the AFM world. And for us founders, it is an incredibly beautiful thing to see how we have become just cogs in the high-tech machine that is Nanosurf today. A large and still growing high-tech machine, the size of which we could not have imagined 25 years ago!

Today, Nanosurf operates across all continents, providing high-tech AFM capabilities, both bespoke and standardized systems across a diverse range of industrial and academic segments. Nanosurf remains at the forefront of technology, and supplies some of the most significant companies involved in the world’s leading technologies and products. We grow by a balanced combination of capability, flexibility, creativity, and drive.

– Lukas Howald, October 2022 –