Professor Christoph Gerber
Professor at the Department of Physics
University of Basel
Switzerland

Universität Basel

Rektorat

Universität Basel, Rektorat, Postfach 2148, 4001 Basel, Switzerland

The World Cultural Council
Case Postale 373
1630 Bulle 2
Switzerland

Basel, 26. January 2023 / Häg
Nomination of Christoph Gerber for the 2023 Albert Einstein World Award of Science

Dear Interdisciplinary Committee

It is our exceptional honor and pleasure to re-nominate Prof. Christoph Gerber to receive the 2023 Albert Einstein World Award of Science.

In 1986 Christoph Gerber pioneered, together with Gerd Binnig and Calvin Quate, the invention and realization of atomic force microscopy AFM, which has turned out to be a tremendous breakthrough among the techniques allowing the portrayal of probes at atomic resolution. While other scanning probe microscopy techniques are fighting with inherent technical restrictions, AFM is most versatile, allowing not only the imaging of conducting and insulating probes, but also their manipulation on an atomic scale, much like 3-D printing with atoms. With the possibility to use the technique also on liquid surfaces, it opened up unimagined applications in life sciences, from the manipulation and measurement of forces of configuration states of individual biomolecules, over sensing the existence of individual molecules, to reliable and rapid medical cancer diagnostics. In fact the development of the technique and its application to science at the nanoscale in physics, chemistry, material science and life science has only just begun and we will undoubtedly see many more surprising results in the years to come.

With his dedication to science and his continued development of the technique, Christoph Gerber is a true role model in scholarship. His enthusiastic personality was able to inspire many young scientists at our University and other institutions, and through his work this inspiration will also transmit to future generations that will continue to recognize the significant impact of Prof. Gerbers work to the well-being of mankind.

Yours sincerely

Prof. Dr. Torsten Schwede
Vice President for Research

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To the
Selection Committee
of the
2023 Albert Einstein World Award of Science

Prof. Dr. Jochen Mannhart
Director
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Stuttgart, 26.01.2023

Ref.: Nomination of Prof. Ch. Gerber for the Albert Einstein World Award of Science

Dear Members of the Selection Committee,

It has come to my attention that Prof. Ch. Gerber is to be nominated for the 2023 Albert Einstein World Award of Science. This is an outstanding nomination, which I enthusiastically support, because Prof. Gerber has made eminent and decisive contributions to the advancement of life sciences in particular and science in general. His achievements are ideally aligned with the intent and spirit of the World Award of Science.

The life sciences, from biochemical research to medical applications, are advancing rapidly. This progress is driven in large part by the ability to explore biochemical systems on the nanometer and atomic level. The key techniques for this research are scanning force microscopy and chemical sensing with cantilever-based nanoprobes. These tools were introduced in the 1990s and then systematically optimized, such that they are now in daily practical use in laboratories throughout the world, for example to explore biomolecules in fluidic environments or to trace organic molecules with utmost sensitivity.

Owing to the importance and relevance of this research – hundreds, perhaps thousands – of scientists are working to optimize and utilize these probes. Although this intense worldwide effort is pursued by a very large number of scientists, there is one single, highly

creative person who stands out as an originator of this breakthrough and as a leader in bringing these advancements to their full potential. That person is Prof. Christoph Gerber.

Professor Gerber, Gerd Binnig and Calvin Quate are the inventors of scanning force microscopy, which is the basis for the ongoing revolution. Professor Gerber recognized early on that, in addition to its imaging capabilities, scanning force microscopy enabled breakthrough capabilities for characterization and analysis of materials on the atomic, molecular and cellular level. For example, he was one of the pioneers of atomic force spectroscopy, which allows organic molecules to be characterized by measuring their individual elastic properties. Professor Gerber has advanced atomic force microscopy in fluid environments and high-speed microscopy, which allows instruments to be built to monitor biological processes *in situ* and in real time. In addition, Prof. Gerber pioneered the use of functionalized cantilevers for selective detection of single molecules based on their heats of reaction with functional surfaces. To conclude this brief and non-exhaustive list of Christoph Gerber's decisive contributions to nanotechnology, I would like to emphasize that these accomplishments go far beyond the field of life sciences by providing enormously significant implications for the fields of physics and chemistry as well.

Given the sheer incredible creative work Prof. Gerber has achieved in qualitatively advancing nanoscience and the impact this work has had on the well-being of humanity, I believe Prof. Gerber is the ideal candidate for the Albert Einstein World Award of Science. I therefore support his nomination in the strongest terms possible.

Sincerely yours,

Prof. Dr. Jochen Mannhart

Director
Max Planck Institute for Solid State Research

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Basel, 20. January 2023

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México

Nomination of Prof. Dr. Christoph Gerber for the Albert Einstein World Award of Science

Dear Ladies and Gentlemen,

Enclosed please find my nomination of Prof. Dr. Christoph Gerber (Swiss Nano Institute, University Basel, Switzerland) for Albert Einstein World Award of Science.

Scientific standing, scientific achievements and international visibility

A first successful approach to directly image and manipulate atoms at true atomic resolution. In 1981 Gerber together with Gerd Binnig and Heinrich Rohrer introduced a new type of microscope that initiated the nanotechnological revolution. Unlike traditional microscopes the scanning tunneling microscope (STM) did not use lenses. Instead, a sharp tip was moved close enough to a conductive surface for the electron wavefunctions of the atoms in the tip to overlap with the wavefunctions of the surface atoms. When a voltage was applied, electrons started to 'tunnel' through the vacuum gap, causing a current to flow from the foremost atom of the tip into the surface. For this millennium achievement, for which Gerd Binnig and Heinrich Rohrer received the Nobel Award in Physics in 1986, Christoph Gerber was instrumental to bring the STM to life. Christoph Gerber was also the first observing single atoms using the STM, which inspired the scientific world to use STM and to apply it to all kind of solid state materials and surfaces. Soon after, the STM could be applied to pick up and deliver atoms, to manipulate molecules or nucleic acids. In the meantime, STM can be applied to image orbitals of molecules and atoms, to switch chemical bonds, or to image magnetic dipoles. The STM thus contributed to the nanotechnological revolution and to the opening of the door of the nanoworld.

The brake through development of atomic force microscopy. Shortly after inventing the STM, Binning and Gerber recognized the need of a microscope to image non-conducting surfaces at atomic resolution. They thus though about a new concept of a microscope, the atomic force microscope (AFM), which invention in 1986 contributed even more to the nanotechnological revolution than the STM. As with the STM, the AFM relies on a sharp tip that is scanned over a surface. The tip being part of a cantilever that measures forces at atomic and molecular ranges. In a sense the AFM resembles a record player the forces between the surface and the atomically sharp tip cause the cantilever to bend in the vertical direction, and by measuring this deflection, it is possible to produce an image of the surface with atomic resolution. It was soon discovered that the forces measured with the AFM can be attractive or repulsive and depend on the nature of the interaction between the tip and the sample. Examples include chemical forces, van der Waals forces, electrostatic forces, capillary forces or friction forces.

First designed as an instrument to image the surfaces of non-conductive materials with high lateral and vertical resolution, the principle of the AFM has been adapted to work in various environments (for example, in liquids, at low temperatures, in high magnetic fields and so on), and also for chemical and biological applications when the tip is suitably modified. Its ability to investigate surfaces with unprecedented resolution introduced a wealth of related techniques. For instance, local electric charges on the tip or surface lead to electrostatic forces that allow the distribution of electric charge on a surface to be visualized. Other applications of the AFM allowed to image (bio)molecular systems and to map their chemical information at the same time. Similarly, magnetic forces can be imaged if the tip is coated with a magnetic material, such as cobalt, that has been magnetized along the tip axis. In other applications, the AFM has been adapted to image and manipulate living biological systems, to measure and manipulate chemical bonds or to measure biological interactions of receptor and ligands or of mammalian cells adhering to each other. Other examples apply AFM to image and dissect biological systems such as cells, chromosomes, membranes, proteins or DNA. In other contributions, Christoph Gerber co-introduced the AFM to sense single molecules from the gas and liquid phase or to measure the weight of living cellular systems. All this work, was highly inspired by Christoph Gerber, who pioneered not only the invention of the AFM but importantly also manifold applications of the AFM to physical, chemical and biological problems.

Conclusions

In summary, since its invention in 1986, the STM and more importantly the AFM have proven their suitability in various physical, chemical, biological and medical applications. The AFM was even shoot to the Mars to characterize the environment. Statistically, there is no physical and chemical laboratory not having at least one AFM or STM, which enables researchers to investigate and manipulate their samples at the nanoscale. However, the unique possibility to image, probe and manipulate materials with unprecedented resolution and the ability to be combined with other technologies made the AFM the most powerful and versatile toolkit in nanoscience and nanotechnology. As a consequence, the revolutionary concept of the AFM enabled the development of numerous new technologies across all disciplines. Besides co-inventing STM and AFM, the beautiful concept of Gerber to adapt and apply scanning probe microscopy to address pertinent problems from the micro to the nanoscale and across all scientific disciplines is a major outcome of his scientific work, which nowadays impact many areas of science, including biology, medicine, and nanotechnology. Wnen initiating his concepts Christoph Gerber did not follow the mainstream of science, but generated new ideas that were scientifically outstanding, highly relevant to other areas of science, and truly unexpected. It is clear that such fundamental ideas and concepts that change physical concepts and have direct impact on a wide field of applications are generated only a few times in a century. This makes Christoph Gerber an outstanding candidate for receiving prestigious awards such as the **Albert Einstein World Award of Science**. I would like to add that the recent accumulation of prestigious awards received by Christoph Gerber, including the recently received Kavli Prize, may be a promising indication that he will hopefully soon receive most prestigious scientific awards and merits.

For these reasons, I very strongly recommend Christoph Gerber as an internationally outstanding candidate for the Albert Einstein World Award of Science.

Sincerely,

Prof. Dr. Daniel J. Müller

Achievements Christoph Gerber

Christoph Gerber is a titular professor at the Department of Physics, University of Basel, Switzerland. He was a founding member and Director for Scientific Communication of the NCCR (National Center of Competence in Research) Nanoscale Science and acted more than 15 years as a Vice-Director on the board of the SNI (Swiss Nanoscience Institute) at the University of Basel. He was formerly a Research Staff Member in Nanoscale Science at the IBM Research Laboratory in Rüschlikon, Switzerland, and has served as a project leader in various programs of the Swiss National Science Foundation and in the 6th European Research Framework.

For the past 40 years, his research has been focused on Nanoscale Science. He is a pioneer in Scanning Probe Microscopy, and he made major contributions to the invention of the Scanning Tunneling Microscope and the Atomic Force Microscope (AFM), he is also a co-inventor of Biochemical sensors based on AFM Technology, his current field of research.

He is the author and co-author of more than 180 scientific papers that have appeared in peer-reviewed journals and has been cited more than 39‘400 times (Web of Science) Google Scholar: 66’432 https://scholar.google.com/citations?user=w9b8kbgAAAAJ&hl=de in cross-disciplinary fields. He belonged to the one hundred worldwide most cited researchers in Physical Sciences in the year 2000. He has given numerous plenary and invited talks at international conferences.

His work has been recognized with multiple honorary degrees and various awards and appeared in numerous articles in daily press and TV coverage. 2016 he was awarded the Kavli Prize in Nanoscience as a co-recipient with Gerd Binnig and Calvin Quate for the Atomic Force Microscope. He is a Fellow of the American Physical Society, a Fellow of the World Technology Network and a Fellow of the IOP Institute of Physics UK. He serves on the advisory boards of several nano institutes and has chaired and co-chaired various international conferences. His IP portfolio contains 39 patents and patent publications.

His way of addressing challenges follows the concepts of Nature. Nature is the best example of a system functioning on the nanometer scale, where the involved materials, energy consumption and data handling are optimized. The emergence of Atomic Force Microscopy (AFM) 37 years ago in the then fledgling field of nanotechnology led to a shift of paradigm in the understanding and perception of matter at its most fundamental level. It undoubtedly has opened new avenues in physics, chemistry, biology and medicine and still is inspiring researchers around the world testified so far by more than 300’000 scientific articles on AFM in peer reviewed journals. Moreover, an AFM has already been sent to the Martian surface and one was on board of the recent European Rosetta mission to a comet to investigate stardust on the nanoscale. It seems not even the sky is the limit for AFM technology.

The concept behind Atomic Force Microscopy is strikingly simple: a nanoscale tip scans across a sample surface at atomically close range where the tiny forces between the sample and the tip are detected. These forces reveal many important properties of the sample, such as the arrangement of its individual atoms, now even with subatomic resolution. Electric and magnetic interactions, friction, and chemical bonding can induce these forces. The technique is applicable over a wide temperature range and in magnetic fields. Unlike

scanning tunneling microscopy, atomic force microscopy can also be applied to insulating materials.

Another achievement with a tremendous impact is Nanosculpting. The term refers to adding, arranging, and removing atoms to produce desired phenomena and functions. The tip provides a versatile tool for accomplishing such control. Being able to manipulate conductors and insulators at the nanoscale has applications comparable to those of nanoscale 3D printing. Nanostructures created by force microscopy-based techniques include devices in nanomechanics, nanoelectronics, nanophotonics, nanomagnetism and quantum mechanics.

Especially in life sciences the advantages of atomic force microscopy have become obvious: this includes experimenting in fluidic environment, which opens the possibility of exploring biological systems. A single molecule, such as a DNA or a protein molecule, can be suspended between the tip and surface. Lifting the tip stretches and unfolds the molecule. The measured restoring force reveals the molecule's elastic properties and functionality. High speed AFM for the first time enables to visualize biological functions in real time including dynamics in the time domain of chemical reaction monitoring the cellular machinery at the nanoscale and millisecond resolution.

Complementary to imaging and control on a molecular level, he pioneered the development of biochemical sensors based on the in-situ detection of biological reactions by temperature- and stress-sensitive cantilevers arrays, opening new doors for medical applications in fast and early diagnostics on the genetic level with point mutation resolution. Major recent research achievements with this technology have contributed to the field of rapid medical diagnosis of conditions caused by multidrug-resistant (MDR) bacteria in treatment with antibiotics and their severe complications in sepsis. The method offers unprecedented sensitivity down to 20 bacteria at fast response times within less than 10 minutes in Gram-positive and Gram-negative bacteria. The cantilever sensors are faster than standard pyrosequencing methods and comparably sensitive as next-generation sequencing. Neither labelling, nor PCR amplification or sequencing are required in our method. The technique has the potential to play a vital role in personalized diagnosis including capturing circulating tumor cells (CTCs) in the bloodstream in the emerging field of liquid biopsies. Tailoring treatments to genetic makeup is part of the vision for precision medicine where all care is costume-fit to an individual DNA and genetic drug matching, which drugs work best for patients, what doses works best is part of Pharmacogenomics.

In addition, Atomic Force Microscopy has spawned a wide variety of measurement techniques invaluable for many purposes. These range from magnetic force and chemical force microscopy to magnetic resonance spectroscopy, scanning capacitance microscopy, friction force microscopy, single molecule spectroscopy and others all the way to biomedical sensing.

The high flexibility of AFM to image, probe and manipulate materials with unprecedented resolution and the ability to be combined with other technologies made it the most powerful and versatile toolkit in nanoscience and – technology of today. As a consequence, such new revolutionary concepts stimulated numerous new technologies across all disciplines and beyond for the benefit of mankind.

Curriculum Vitae of Christoph Gerber

Christoph Gerber is a titular professor at the Department of Physics, University of Basel, Switzerland. He was a founding member and Director for Scientific Communication of the NCCR (National Center of Competence in Research) Nanoscale Science and acted more than 15 years as a Vice-Director on the board of the SNI (Swiss Nanoscience Institute) at the University of Basel. He was formerly a Research Staff Member in Nanoscale Science at the IBM Research Laboratory in Rüschlikon, Switzerland, and has served as a project leader in various programs of the Swiss National Science Foundation and in the 6th European Research Framework.

For the past 40 years, his research has been focused on Nanoscale Science. He is a pioneer in Scanning Probe Microscopy, and he made major contributions to the invention of the Scanning Tunneling Microscope and the Atomic Force Microscope (AFM), he is also a co-inventor of Biochemical sensors based on AFM Technology.
He is the author and co-author of more than 180 scientific papers that have appeared in peer-reviewed journals and have been cited more than 39‘438 times in cross-disciplinary fields (Google Scholar: 66’432 times). He belonged to the one hundred worldwide most cited researchers in Physical Sciences in 2000. He has given numerous plenary and invited talks at international conferences.

His work has been recognized with multiple honorary degrees and various awards and appeared in numerous articles in daily press and TV coverage. 2016 he has been awarded the Kavli Prize in Nanoscience together with Gerd Binnig and Calvin Quate for the Atomic Force Microscope. He is a Fellow of the American Physical Society, a Fellow of the World Technology Network and a Fellow of the IOP Institute of physics UK. He serves on the advisory boards of several nano institutes and has chaired and co-chaired various international conferences. His IP portfolio contains 37 patents and patent publications. His private interests range from literature (scientific and a good novel) to art and sports (he is a passionate skier and plays an acceptable round of golf).

Academic memberships and external activities

- Co-organizer STM Conference Interlaken, Switzerland, August 1991
- Chairman of Plenary session International Conference on STM Beijing, China, 1993
- Invited consultant NATO program in Nanoscale Science, 1993-1997
- Co-director ASI NATO School, Schluchsee, Germany, March 1994
- Co-director NATO Workshop Cambridge, UK, April 1994
- Tutor to graduate students on Nanoscale Science, Bern, Switzerland, April 1994
- Director NATO Workshop Loch Lomond, Scotland, October 1995
- Co-organizer Japanese-Swiss Science Seminar, Ascona, Switzerland, 1996
- Co-project leader Swiss Science Foundation (NFP36), 1996-1998
- Project leader Swiss Priority Program on Micro- and Nanosystems, 1996-1999
- Chairman International Conference of STM/AFM application, Dresden, Germany, April 1997
- Chairman Conference of the Directors Nato Workshops and Schools in Nanoscale Science, Toledo, Spain, May 1997
- Chairman Application SPM, Cambridge, October 1997
- Co-chairman SXM 3 Conference Technological Application of Scanning Probe Methods, Basel, Switzerland, September 1998
- Co-chairman Conference Noncontact Dynamic AFM, Pontresina, Switzerland, Sept. 1999
- Guest Editor Applied Surface Science, April 2000

- Member of Steering Committee International Center of Quantum Structure, Chinese Academy of Science, October 2000
- Chief Judge for Science Talent Search, National Science & Technology Board, State of Singapore, February 2001
- Member of the Innovation Committee, National Program TOP Nano 21, Switzerland, February 2001
- Project Leader Molecular Machinery NCCR Swiss National Program for Nanoscience June 2001
- Member of the Editorial Board, Journal of Nanotechnology, April 2001
- Member of the Steering Committee, Consortium Intramolecular Computation, April 2001
- Managing Editor, Journal of Nanoscience, August 2001
- Member of the Steering committee NCAFM conference 2003 September Dublin Irland December 2002
- Member of the Editorial Board Central European Science Journal February 2003
- Member of Scientific committee EMN04 October 2004 Paris France
- Member of external expert panel faculty position professor in Bio/Nanoscience University of Lund Sweden March 2004
- Co-Organiser FRONTIERS Workshop "Bio-Nano", Lenzerheide (Switzerland) January 16-19, 2005
- Advisor to ATI Advanced Technology Institute Tokyo, Japan March 2005
- Member Advisory Board EU framework 6 Nano Safe Brussels August 2005
- Member Advisory Board Nanocenter CRANN Trinity college Dublin IR August 2005
- Member of the editorial board journal Nano Feb. 2006
- Co-Organiser FRONTIERS Workshop "Understanding processes at the molecular level", Lenzerheide (Switzerland) March 19-23, 2006
- Co organiser ICN&T2006 Basel Switzerland July 31 August 4 2006
- Guest Editor Nanotechnology, January 2007
- Co-Organiser FRONTIERS Workshop "Exploring new FRONTIERS in Bio/Nano", Zermatt (Switzerland) March 18-22, 2007
- Member of Editorial Advisory Board Journal 'ACS Nano' (American Chemical Society), August 2007
- Co-Organiser FRONTIERS Workshop "FRONTIERS Bio-Nano Winter School", Zermatt (Switzerland) March 9-13, 2008
- Member of the World Economic Forum's Global Agenda Council on the Challenges of Nanotechnology, June 2008
- Member of the International Advisory Board for the King Abdullah Institute of Nanotechnology, Riyadh/Saudi Arabia, June 2008
- Co-chair CIMTEC 2010, 12th International Ceramic Congress, “Disclosing materials at Nanoscale”, June 6-11, 2010, Montecatini Terme, Tuscany, Italy.
- Chair “Seeing at the Nanoscale VIII, Basel, 30.8.-3.9.2010.
- Member of the International Scientific Committee of the NanoBio 2010 Conference, Zürich, Switzerland
- Advisory Board Member of the Beilstein Journal of Nanotechnology, January 2010
- Member of the Scientific American Audience Panel, January 2010
- Member of the advisory board: Nanometer Structure Consortium at Lund University October 2011
- Member of the program committee Swiss Nanoconvention Lausanne May 2012
- Journal Nanotechnology Discussion podcast to celebrate the 25th volume on Tuesday 29th October 2013
- Celebration 20th volume journal nanotechnology Dec. 2013 Podcast discussion Profs. Gerber, Giessibl and Gimzewski http://iopscience.iop.org/0957-4484/page/Nanotechnology

%20Discussions%20podcasts
- Member scientific committee 2nd Dresden Nanoanalysis Symposium July 2-3, 2014 Dresden
- Member of Advisory board IRC program Nanoinstitute University College London UCL 2014
- Member of the IMDEA Nanosciencia Scientific Advisory Board, Madrid (Spain), 2014-19
- IAS Benjamin Meaker Visiting Professorship (BMVP) 2014/2015, Bristol

Inventions
- 37 patents and patent publications including numerous IBM inventions achievement awards

Awards and Honours
- IBM Research Division Awards: 1975, 1979, 1982, 1990, 1991, 1997 on various subjects
- IBM Research Division Outstanding Contribution Award for Design Development and Technology Transfer of STM, 1984
- IBM Outstanding Technical Achievement Award for the Contribution to Commercialization of STM, 1987
- IBM Outstanding Technical Achievement Award for the invention of the Atomic Force Microscope, 1987
- Dr. phil. II h.c., University of Basel, Switzerland, 1987
- IBM Recognition Event for Outstanding Contribution, 1988
- Fellow of the American Physical Society (APS), October 1999
- Honorary Professor of the University of St. Andrews, Scotland, February 2000
- Honorary Professor Chinese Academy of Science, Institute of Physics, October 2000
- Among the 100 most cited researchers in physical science in the world, November 2000
- Titular professor, Department of Physics, University of Basel, Switzerland, since 2004
- Co-recipient of the Economist Innovation award No boundaries September 2004
- Fellow Institute of Physics IOP UK November 2004
- World Technology Award for IT Hardware, World Technology Network, November 3, 2006
- Fellow of the World Technology Network (WTN), November 2006
- Research Excellence Award, Nano / Bio Interface Center, University of Pennsylvania, February 2007
- James Waters Award Lecture for the Development of AFM Technology, February 2007
- Science Prize of the State of Basel, Switzerland, August 2011
- Scientific Excellence Award of the Alliance for NanoHealth Houston Texas, October 2011
- Life time achievement award, Nature Publishing Group, Nature Biotechnology, Nature Nanotechnology, Nature Medicine, February 2012
- Honorary Professorship University St. Andrews, Scotland, September 2013-August 2016
- Who is Who in Switzerland the one hundred most important people 2013
- Elected by the "Who is Who in Basel" Committee for 2014 http://www.ww-magazin.ch/ww-basel/komitee-basel.php
- International Society for Nanoscale Science, Computation, and Engineering (ISNSCE) Nanoscience Prize 2016, Snowbird (USA), May 2016
- 2016 he has been awarded the Kavli Prize in Nanoscience together with Gerd Binnig and Calvin Quate for the Atomic Force Microscope.
- November 2016: Honorary Doctor Degree from Univ. Twente, The Netherlands.
- Since Dec 2016 Member of the Norvegian Academy of Science as Laureate of the Kavli Prize
- Elected by the "Who is Who in Basel" Committee for 2017
- Honorary Member of the Swiss Nanoscience Institute, September 2017

10 Most important AFM related publications

Atomic force microscope
G Binnig, CF Quate, C Gerber
Physical review letters 56 (9), 930 1986

Atomic resolution with atomic force microscope
G Binnig, C Gerber, E Stoll, TR Albrecht, CF Quate
EPL (Europhysics Letters) 3 (12), 1281 1987

Photothermal spectroscopy using a micromechanical device
JR Barnes, RJ Stephenson, ME Welland, C Gerber JK Gimzewski
Nature volume 372 Issue 6501 pages 79-81 Nov. 1994

Surface stress in the self-assembly of alkanethiols on gold
R Berger, E Delamarche, HP Lang, C Gerber, JK Gimzewski, E Meyer, HJ Güntherodt
Science 276 (5321), 2021-2024 1997

Translating biomolecular recognition into nanomechanics
J Fritz, MK Baller, HP Lang, H Rothuizen, P Vettiger, E Meyer, HJ Güntherodt, C Gerber, JK Gimzewski
Science 288 (5464), 316-318 2000

Multiple label-free biodetection and quantitative DNA-binding assays on a nanomechanical cantilever array
R McKendry, J Zhang, Y Arntz, T Strunz, M Hegner, HP Lang, MK Baller, U Certa, E Meyer, HJ Güntherodt, C Gerber
Proceedings of the National Academy of Sciences 99 (15), 9783-9788 2002

Rapid and label-free nanomechanical detection of biomarker transcripts in human RNA
J Zhang, HP Lang, F Huber, A Bietsch, W Grange, U Certa, R McKendry, HJ Güntherodt, M Hegner, C Gerber
Nature nanotechnology 1 (3), 214-220 2006

Direct detection of a BRAF mutation in total RNA from melanoma cells using cantilever arrays
F Huber, HP Lang, N Backmann, D Rimoldi, C Gerber
Nature nanotechnology 8 (2), 125-129 2013

Inertial picobalance reveals fast mass fluctuations in mammalian cells
D Martínez-Martín, G Fläschner, B Gaub, S Martin, R Newton, C Beerli, J Mercer, C Gerber, DJ Müller
Nature 550 (7677), 500-505 2017

Imaging modes of atomic force microscopy for application in molecular and cell biology
YF Dufrêne, T Ando, R Garcia, D Alsteens, D Martinez-Martin, A Engel, C Gerber, DJ. Müller
Nat. Nanotechnology 12 (4) 295-307 2017

Prof. Dr. Christoph Gerber

Chronological publication list:

1. "A Spin-Flop Bicritical Line in GdAlO3"
   H. Rohrer, B. Derighetti and Ch. Gerber
   Physica 86-88 B&C, Part II, 597-598 (1977).

2. "Bicritical and Tetracritical Behavior of GdAlO3"
   H. Rohrer and Ch. Gerber
   Phys. Rev. Lett. 38(16), 909-912 (1977).

3. "Polykritischer Punkt im Antiferromagneten GdAlO3"
   H. Rohrer, Ch. Gerber and B. Derighetti
   Helv. Phys. Acta 50, Fasc. 5, 603 (1977).

4. "Crossover Effects near the Spin–Flop Multicritical Point"
   H. Rohrer and Ch. Gerber
   J. Appl. Phys. 49(3), Part II, 1341-1343 (1978).

5. "Critical–Bicritical Crossover at the Spin–Flop Transition of Antiferromagnets"
   H. Rohrer and Ch. Gerber
   Europhys. Conf. Abstr. 2G, pp. 56 (1978).

6. "Tunneling through a Controllable Vacuum Gap"
   G.K. Binnig, H. Rohrer, Ch. Gerber and E. Weibel
   Appl. Phys. Lett. 40(2), 178-180 (1982).

7. "Surface Studies by Scanning Tunneling Microscopy"
   G.K. Binnig, H. Rohrer, Ch. Gerber and E. Weibel
   Phys. Rev. Lett. 49(1), 57-61 (1982).

8. "Vacuum Tunneling"
   G.K. Binnig, H. Rohrer, Ch. Gerber and E. Weibel
   Physica 109/110 B&C(1/3), Part III, 2075-2077 (1982).

9. "7×7 Reconstruction on Si(111) Resolved in Real Space"
   G.K. Binnig, H. Rohrer, Ch. Gerber and E. Weibel
   Phys. Rev. Lett. 50(2), 120-123 (1983).

10. "(111) Facets as the Origin of Reconstructed Au(110) Surfaces"
    G.K. Binnig, H. Rohrer, Ch. Gerber and E. Weibel
    Surf. Sci. 131(1), Part II, L379-L384 (1983).

11. "Real-Space Observation of the 2×1 Structure of Chemisorbed Oxygen on Ni(100) by Scanning Tunneling Microscopy"
    A.M. Baró, G.K. Binnig, H. Rohrer, Ch. Gerber, E. Stoll, A. Baratoff and F. Salvan
    Phys. Rev. Lett. 52(15), 1304-1307 (1984).

12. “Real-Space Observation of the Reconstruction of Au(100)”
G.K. Binnig, H. Rohrer, Ch. Gerber and E. Stoll
Surf. Sci. 144(2/3), 321-335 (1984).

13. “Surface Roughness Standards, Obtained with the Scanning Tunneling Microscope Operated at Atmospheric Air Pressure”
N. García, A.M. Baró, R. Miranda, H. Rohrer, Ch. Gerber R. García Cantú and J.L. Peña
Metrologia 21, 135-138 (1985).

14. “Determination of Surface Topography of Biological Specimens at High Resolution by Scanning Tunneling Microscopy”
A.M. Baró, R. Miranda, J. Alamán, N. García, G.K. Binnig, H. Rohrer, Ch. Gerber and J.L. Carrascosa
Nature 315, 253-254 (1985).

15. “Revisiting the 7×7 Reconstruction of Si (111)”
G.K. Binnig, H. Rohrer, F. Salvan, Ch. Gerber and A. Baró
Surf. Sci. 157(2/3), L373-L378 (1985).

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