

Invitation

We are pleased to announce NanoScale 2019, the 12th seminar on Quantitative Microscopy and the 8th Seminar on Nanoscale Calibration, Standards and Methods focusing on nanoscale characterization techniques based on high resolution tactile and optical microscopy, scanning probe microscopy and other high resolution techniques.

The event will be held from October 15th–16th, 2019 at the PTB Braunschweig.



Physikalisch-Technische Bundesanstalt
Bundesallee 100
38116 Braunschweig
Germany

Seminar

The seminar includes two days of technical presentations and posters. It will bring together researchers from industry, universities and metrology institutes world-wide to present experimental results and developments and to discuss problems related to characterization of micro- and nano-structures.

Scope of the seminar

The NanoScale seminar will **stimulate the exchange of experiences** between researchers, industrial users and metrologists in the fields of optical, electron, and scanning probe microscopy as well as related techniques, to solve daily measurement challenges in the micro- and nano-world.

The **accurate determination** of geometrical and other physical properties of micro- and nano-structures is essential not only for research and development, but increasingly also a prerequisite in process control and quality assurance in a broad range of industries from ultra-precision manufacturing to nano-biology and medicine.

Changes of **physical properties are correlated to the size** of structures, too. This requires stable instruments with high resolution and small measurement uncertainty.

Furthermore, **areal-based measurements** become more and more important against single profile-based techniques and are often indispensable to determine the surface topography and extract those parameters that are vital for the assessment of the sample's functional properties. Increasingly, other properties than just topography need to be measured. Therefore, new techniques or combinations of methods are necessary.

New methods suitable for the investigation at the nanoscale need to be evaluated and thoroughly tested. The specification, characterization and calibration of instruments requires well elaborated, generally agreed and accepted uniform standardized procedures. Such rules are to be defined and agreed in national and international committees.

Finally, measurements result in a quantitative number and unit describing a geometrical or physical property. This has to be combined with the measurement uncertainty, determined by using an appropriate measurement uncertainty budget, to achieve a traceable result and ensure comparability over long time and, whenever possible, across methods – a particularly challenging task in nanometrology.

Topics to be addressed

Instrumentation and methods

Advances in instrumentation such as repeatable probe/sample positioning, position-measuring systems, linearization methods, high-speed, low force, novel/improved probe/detector systems, novel 3D probing concepts, probe-sample interaction image processing, as well as modelling and simulation techniques.

A few examples:

- High-resolution optical microscopy including simulation
- Interferometry to measure the displacement of objects
- Atomic Force Microscopy (AFM) including simulation
- Further Scanning Probe Microscopy (SPM) techniques
- High-resolution, low force tactile instruments for profile or areal measurement

- Electron Microscopy (SEM, TSEM, TEM, STEM)
- Hybrid instruments combining different measurement techniques and exploiting different physical interactions for holistic sample characterization.

Calibration & correction methods

The specification of instruments is a prerequisite for any accurate and traceable measurements.

- Setup of instruments and the definition of the metrology specification
- Development of documentary standards and material measures (transfer standards)
- Recipes for stitching of measured images and fusion of data
- Evaluation of the measurement uncertainty for more complex measurement tasks
- Reports about accomplished comparisons

Applications

Quantitative measurements in fields like

- Geometry of micro- or nano-objects and related parameters
- Relationships of surface topography parameters and its functional behavior
- Measurement of complex structures, e. g. in micro-systems/-electronics, nano/quantum/molecular electronics and other devices, incl. applications in biology and medicine

Abstracts

Participants wishing to present a paper are asked to submit an abstract by using the online formular at web page: www.nanoscale.de

Deadline for abstract submission is
March 29th, 2019.

Notification of acceptance by
May 20th, 2019.

Proceedings

It is intended to publish reviewed manuscripts as conference proceedings. The authors are asked to submit manuscripts (up to 8 pages) at the latest at the seminar.
More details at: www.nanoscale.de

