NANOSCALE 2023 AT A GLANCE

Version 1 of 2023-09-14

Finnish time is East European Summer Time (eest)! This list is intended as a quick&easy overview only. For the details incl. all co-authors, their affiliations, exact times of the talks, coffee-breaks and other information, please refer to the detailed Session Programme and List of Posters in the Book of Abstracts.

Tuesday, 11:00-13:00		**CHECK-IN**
		Handout of Book of Abstracts and name badges. Poster boards ready for the posters, please place your poster there.
		Please note: No lunch served at NanoScale on Tuesday. Please have lunch in town before coming to NanoScale.
		Delegates of TC-L and consortium members of TracOptic will have an early lunch in Espoo and then come to NanoScale.
Tuesday, 13:00-13:15		**OPENING & WELCOME**
	M. Heinonen	Welcome by the Vice-President of VTT MIKES
	Virpi, Thorsten	Opening Remarks
Tuesday, 13:15-14:35		**1st Session – Crystalline calibration standards – chaired by Alexandra Delvallée**
A-1	I. Busch	New ways to calibrate microscopes at nanoscale: How the Silicon lattice parameter is used for new type calibration artefacts
A-2	M. A. Lawn	Step height measurement of monoatomic silicon crystal lattice steps with a commercial Atomic Force Microscope
A-3	L. Daul	New UHV facility for series production of low-cost crystalline standards
A-4	Yushu Shi	Evaluation of the influence of magnification variation on the silicon lattice spacing measurement in high-resolution TEM
Tuesday, 15:00-16:40		**POSTER SESSION A** – please see list of posters at the end of this “NanoScale at a glance”
Tuesday, 16:40-18:00		**2nd Session – MetExSPM Session I – chaired by Antti Lassila**
B-1	V. Korpelainen	MetExSPM (EMPIR-project 20IND08): Development of traceable methods for high speed and large range SPM
B-2	T. Gotszalk	Application of active piezoresistive cantilevers in high-eigenmode surface imaging
B-3	J. Thiesler	A high speed large-range SPM scanner based on a hybrid combination of a magnetic levitation stage and piezo scanners
B-4	P. Klapetek	Data processing in metrological high-speed Scanning Probe Microscopes
Tuesday, 18:15-20:00		**WELCOME RECEPTION**

Wednesday, 09:00-10:20 **3rd Session – AI methods for nanometrology – chaired by Petr Klapetek**

C-1	J. Jin / J. Lee	Deep-learning based thickness and refractive index measurement of a thin-film layer
C-2	M. Ritter	Accuracy aspects of focused ion beam tomography data reconstruction
C-3	Z. Akbarian	AFM calibration at the nanoscale using DNA origami pitch standards and artificial-intelligence-based data refinement
C-4	A. Mattila	Artificial Neural Network-Assisted Spectral Scatterometry for Grating Quality Control

Wednesday, 10:50-12:20 **4th Session – TracOptic Session – Open and free TracOptic Stakeholder Meeting (hybrid) – chaired by Uwe Brand**

D-1	U. Neuschaefer-Rube	The TracOptic-Project – An Overview
D-2	V. Heikkinen	Exemplary instrument characterization (WP 1)
D-3	S. Gao	Systematic performance deviations of optical surface topography measuring instruments (WP 2)
D-4	H. Hooshmand	Scattering methods for modelling optical surface topography measurement instruments (WP 3)
D-5	M. Zucco	Selection of appropriate instrumentation and procedures for data evaluation and uncertainty estimation (WP 4)

Wednesday, 12:20-13:20 **LUNCH**

Wednesday, 13:20-13:45 **Overview presentation – chaired by Marco Pisani**

E-0	H. Bosse	European Metrology Network (EMN) for Advanced Manufacturing – Focus on nanometrology

Wednesday, 13:50-14:50 **5th Session – Simulation and modelling – chaired by Bakir Babic**

E-1	D. Linnert	Simulative prediction of work-piece influences on chromatic confocal distance measurements
E-2	E. Oertel	Modelling the measurement process for the radius and roundness measurement of micro spheres
E-3	Min Xu	Validation of data evaluation algorithm for the calibration of 3D standards using an AFM simulator

Wednesday, 15:10-17:00 **POSTER SESSION B** – please see list of posters at the end of this “NanoScale at a glance”

Wednesday, 17:00-18:20 **6th Session – SPM methods – chaired by Teodor Gotszalk**

F-1	S. de Préville	A robust, high-throughput scanning microwave microscope
F-2	F. Piquemal	Calibrating Resistance Measurements in Conductive Probe AFM: development of 1st universal standard sample
F-3	B. Babic	Immersive visualisation for metrological Scanning Probe Microscopy data sets
F-4	S. Douri	Numerical investigation of the nano-contact heat transfer for SThM probes

Wednesday, 19:00-21:00 **CONFERENCE DINNER**

Thursday, 09:00-10:00		**7th Session – MetExSPM Session II – chaired by Andrew Yacoot**
G-1	E. Heaps	Application of nanometrology to improve nanopositioning stages with applications in High-Speed AFM
G-2	G. Dai	Progress on traceable surface & nanometrology: 2nd nanomeasuring & nanopositioning machine (NMM) at PTB
G-3	T. Gotszalk	Surface measurements using Omega type active piezoresistive SPM cantilevers

Thursday, 10:30-11:30		**8th Session – SEM and interferometry – chaired by Christian Kottler**
H-1	T. Klein	Refined image analysis&simulation for traceable nanoparticle size meas’t over wide size range by SEM in transmission…
H-2	M. Aketagawa	New demodulation method without low-pass filters for sinusoidal phase modulation interferometer
H-3	M. Pisani	Interferometers at the nanoscale for space applications

Thursday, 11:30-12:00 **DISCUSSION, ARRANGEMENT OF LAB TOURS – CLOSURE**

Thursday, 12:00-13:00 **LUNCH**

Thursday, 13:00-17:00 **LAB TOURS AT VTT MIKES IN ESPOO – please have ID card/passport ready and allow ample time for the lab visits!**

POSTERS

Please keep your posters on the posterboards throughout the conference so that they can be visited also in all coffee breaks.

POSTERS – PART 1		**INTERFEROMETRY**
P-11	A. Bridges	Correction of periodic non-linearities in homodyne optical interferometry by meas’t arm intensity normalisation
P-12	A. Yacoot	Generation and measurement of sub nanoradian angles
P-13	E. Heaps	Characterisation of a novel multi-axis position sensor
P-14	D. Leitz	Compensation method of meas’t dev. by the lateral positioning axis for topo. meas’ts with hetero. Interfero…
P-15	V. Shmagun	Periodic nonlinearities of the fiber interferometric sensor in comparison to commercial homodyne interferometer
P-16	M. Hola / S. Rerucha	Modified common-path differential interferometer with balanced arms and sub-nanometre long-term zero drifts
P-17	S. Rerucha	Characterising and tackling thermally induced zero-drift in displacement measuring interferometry
P-18	Khaled M. Ahmed	Gauge block interferometer designed for gauge blocks calibration with modified uncertainty budget

POSTERS – PART 2		**SCATTEROMETRY and ELLIPSOMETRY**
P-21	S. Soman	Multi-beam coherent Fourier scatterometry
P-22	Anubhav Paul	Exploring the Impact of Steep Side Wall Angles on Nanostructure Far Fields using Coherent Fourier Scatterom…
P-23	S. Bösche	Analysis of fine milled technical surfaces with angular resolved scatterometry
P-24	J. Grundmann / B. Bodermann	Adaptions of a conventional imaging ellipsometer for the full Mueller matrix
P-25	T. Käseberg	Resonance enhanced optical nanometrology
P-26	J. Krüger	Enhancement of an on-going photomask CD-comparison by a new approach for model-based optical measurements

POSTERS – PART 3		**OPTICAL MICROSCOPIES FOR SURFACE TOPOGRAPHY MEASUREMENTS (TracOptic and beyond)**
P-30	S. Gao	EURAMET comparison 1242: Measurement of areal roughness by optical microscopes
P-31	S. Gao	Characterization of topographic spatial resolution … using rectangular gratings & sinusoidal pseudo-chirp standards
P-32	A. Pappas	Comparison of surface texture parameters using CSI, confocal microscopy and focus variation microscopy
P-33	F. Segel	Evaluation of anisotropic resolutions of optical microscopes using Star-shaped material measures
P-34	Z. Jiao	Measurement Noise and ITF Characterization of a Phase Shifting Measuring Module of a Hybrid-Microscope
P-35	R. Artigas	Outline of mechanical & computational methods for non-linearities movement correction for optical profilometry
P-36	L. Ribotta	Quantitative 3D determination of dimensional parameters of surfaces by optical profilometer’s images
P-37	L. Ribotta	A case study for quant. 3D optical characterization of machined technical surface of a cylindrical master roughness
P-38	M. Zackaria / A. Felgner	Calibration of the diamond spherical tip of Rockwell hardness indenters using a confocal laser scanning microscope
P-39	U. Brand	Influence of cooling lubricant residues on the confocal roughness measurement of milled surfaces
P-40 (P-79)	V. Korpelainen	NanoXSpot project: Design+charact. of new gauge for focal spot size det. of X-ray tubes used in ind. computer tomo…

POSTERS – PART 4		**Met.ExSPM**
P-41	B. Sauvet	Implementation of interferometers in a commercial SPM to extend positioning capabilities
P-42	A. Kilpeläinen	Implementation of self-sensing and self-actuating SPM to commercial SPM
P-43	J. Thiesler	A high speed large-range SPM prototype based on a combi. of a magnetic levitation stage and piezo scanners
P-44	R. Šlesinger	Compressed Sensing Method for Scanning Probe Microscopy based on Gaussian Processes
P-45	A. Charvátová Campbell	A new algorithm for function fitting: applications in AFM data analysis

POSTERS – PART 5		**SPM INSTRUMENT DEVELOPMENT**
P-51	M. Valtr	Applications of open hardware Gwyscope controller for adaptive and high-speed SPM measurements
P-52	W.-E. Fu	AFM: the Latest Technology + Increasing Demand on Cali. for Critical-Dim. Meas'ts in Semiconductor
P-53	L. Carcedo	Large Range NMM and Laser Sensor for extended range as primary instrument for surface meas'ts at CEM
P-54	Wu Sen	An ultra-large sample stage atomic force microscope
P-55	A. Sikora	Precise sample tilt reduction system for advanced AFM modes

POSTERS – PART 6		**SPM METHODS other than AFM**
P-61	Hung-Ju Lin	Coaxial tips for scanning microwave microscopy
P-62	F. Piquemal	A num. envirm't for evalu. robustness of Short Open Load cali. for capac. meas'ts in Scanning Microwave Micro…
P-63	S. Douri	Uncertainty evaluation associated with the measurement of thermal conductivity at the nanoscale

POSTERS – PART 7		**TRANSFER STANDARDS and their CALIBRATION**
P-71	D. Nečas	Grating pitch data evaluation methods – good parameter choices and accuracy
P-72	V. Heikkinen	Relative grating orientation measurement by detection of diffracted white light
P-73	V. Byman	Traceable calibration of step heights for CSI microscope substitution measurements
P-74	C. Hellmich	Next generation versatile 3D calibration standards for application in optical and electron microscopy
P-75	L. Heinrich	3D standard orientation influence on coord. marker det. for devel't of cali. method using optical microscopes
P-76	L. Weisser	Standardization of AFM roughness measurements for sub-nm surface roughness
P-77	Ryosuke Kizu	Analysis of self-affine roughness profiles with white noise for line edge roughness measurements
P-78	Zhi Li / U. Brand	Calibration of the bending stiffness of soft AFM cantilevers
P-79	V. Korpelainen	NanoXSpot project: Design+charact. of new gauge for focal spot size det. of X-ray tubes used in ind. computer tomo…
		Shown on posterboard P-40 for organizational reasons

POSTERS – PART 8		**SPECTROSCOPY and ANALYTICS**
P-81	M. Eckert	Characterization of two-dimensional MoS_2 via metrological Raman spectroscopy
P-82	Z. Wang	Overcome the Limit of Depth Meas't: Polymer Thickness Det. Down to ~10 nm Using Confocal Raman Microscopy
P-83	F. Hungwe	Multifaceted Materials Characterisation for Advanced Manufacturing: From Thin Films to Perovskites
P-84	Ramin Omidvar	Toward analytical validation of the nanomechanical signature for medical devices

POSTERS – PART 9		**NANOWIRES**
P-91	L. Ribotta	Nanodimensional characterization on nanowires: an interlaboratory comparison between AFMs
P-92	A. Delvallée	Nanowire dimensional characterization with AFM and SEM: pitch, diameter, height and roundness error meas'ts