23rd international conference on non-contact atomic force microscopy

August 1st to 5th 2022

NCAFM2022

NIJMEGEN

1 Oral contributions

Session list

Monday, August 1st 2022:

11:00–11:20: Welcome

11:20–12:20: **Atomic scale manipulation**

14:00–15:00: **Novel instrumentation and techniques (A)**

16:00–17:20: **Magnetic properties and artificial structures**

Tuesday, August 2nd 2022:

09:00–10:20: **Force mapping on nanoscale structures and study of water**

11:00–12:20: **Novel instrumentation and techniques (B)**

14:00–15:00: **Nanoscale measurements of charge and work function (A)**

16:00–17:20: **Force mapping in liquid and under ambient conditions**

Wednesday, August 3rd 2022:

09:00–10:20: **Nanoscale measurements of charge and work function (B)**

11:00–12:20: **Study of single molecules**

14:00–15:00: **Lateral forces, friction, and energy dissipation**

16:00–17:20: **Characterisation of molecular systems (A)**

Thursday, August 4th 2022:

09:00–10:20: **Oxide surfaces**

11:00–12:20: **2D materials**

Friday, August 5th 2022:

09:00–10:20: **Characterisation of molecular systems (B)**

11:00–12:00: **Novel instrumentation and techniques (C)**

12:00–12:20: Closing remarks

Monday, August 1st 2022

Welcome

11:00 **The organisers** *Welcome*

Atomic scale manipulation

Chair: Loppacher, C.

11:20 **Ebeling, D.** *Constructing covalent organic nanoarchitectures molecule by molecule via scanning probe manipulation.*

11:40 **Schwarz, U.** *Measuring Energetics of Molecular Motions of Surface Species with Non-contact Atomic Force Microscopy.*

12:00 **Štich, I.** *New ultra-fast method for measuring tunnelling rates between an AFM tip and on-surface species.*

Novel instrumentation and techniques (A)

Chair: Glatzel, T.

14:00 **Zahl, P.** *Automated HR-AFM to facilitate molecular discovery and research for complex molecule mixtures.*

14:20 **Eftekhari, Z.** *Time-resolved mapping of light-induced displacement and photovoltage in on-chip coupled piezo/photodiodes.*

14:40 **Oininen, N.** *Machine learning for nc-AFM image interpretation and tip functionalization.*

Magnetic properties and artificial structures

Chair: Hapala, P.

16:00 **Schwarz, A.** *Probing long and short-range magnetic interactions on the nanoskyrmionic Fe monolayer on Ir(111).*

16:20 **Giessibl, F.** *Very weak bonds to artificial atoms formed by quantum corrals.*

16:40 **Weiss, M.** *Line shape analysis of the resonant eigenstates in a quantum corral by means of tunneling spectroscopy and non contact AFM.*

17:00 **Stilp, F.** *Interaction between an artificial and a natural atom.*

Tuesday, August 2nd 2022

Force mapping on nanoscale structures and study of water

Chair: Lotze, C.

09:00 **Priante, F.** *Structure discovery in AFM imaging of ice.*

09:20 **Brown, T.** *Room temperature intramolecular force mapping.*

09:40 **Yamamoto, T.** *Atomic-scale measurement of photoinduced force between a tip and the electron orbital of C_{60} single-molecule.*

10:00 **Jugade, S.** *Nanomechanical Insights into Graphene-Liquid Interface.*

Novel instrumentation and techniques (B)

Chair: Schwarz, A.

11:00 **Sellies, L.** *Isotope detection inside single molecules in scanning-probe based electron spin resonance.*

11:20 **Martin Jimenez, D.** *Chemical bond imaging using torsional and flexural higher eigenmodes of qPlus sensors.*

11:40 **Sugawara, Y.** *Atomic-scale Optical Properties of Pentacene Molecules Measured by Photoinduced Force Microscopy (PiFM).*

12:00 **Heile, D.** *Alignment method for the accurate and precise quantification of tip-surface forces.*

Nanoscale measurements of charge and work function (A)

Chair: Štich, I.

14:00 **da Lisca, M.** *Cross-sectional Kelvin Probe Force Microscopy on III-V epitaxial multilayer stack: challenges and perspectives.*

14:20 **Hoffmann-Vogel, R.** *Electrostatic Forces above Pb on Si(111).*

14:40 **Navarro Rodriguez, M.** *Characterization of Graphene Oxide charge dynamics with Kelvin Probe Force Microscopy.*

Force mapping in liquid and under ambient conditions

Chair: Balajka, J.

16:00 **Su, S.** *Facet-dependent surface charge and hydration of colloidal $SrTiO_3$ nanoparticles at variable pH.*

16:20 **Gisbert, V. G.** *High-Speed Bimodal AFM nanomechanical mapping of collagen self-assembly.*

16:40 **Siretanu, I.** *Correlation between electrostatic and hydration forces on silica and gibbsite surfaces: An Atomic Force Microscopy Study.*

17:00 **Ikarashi, T.** *Visualizing Bias-Dependent Changes in Ionic Liquid/Au Interface Structures by 3D Scanning Force Microscopy.*

Wednesday, August 3rd 2022

Nanoscale measurements of charge and work function (B)

Chair: Farinacci, L.

09:00 **Setvín, M.** *Real-space view on polaron kinetics in oxides.*

09:20 **Glatzel, T.** *Work Function and Friction Measurements of 2D KBr/Graphene Heterostructures.*

09:40 **Miyazaki, M.** *Measurement of spatially resolved surface photovoltage on TiO_2(110) by ac bias KPFM.*

10:00 **Cowie, M.** *Single-dopant band bending fluctuations in $MoSe_2$ measured with electrostatic force microscopy.*

Study of single molecules

Chair: Telychko, M.

11:00 **Pérez, R.** *Molecular identification with AFM images and deep learning.*

11:20 **Vilhena, G.** *Nanomanipulation and Dynamics of Single-Molecules at Surfaces.*

11:40 **Gallardo, A.** *Real-space imaging of σ-hole by means of Kelvin probe force microscopy.*

12:00 **Henry, J.** *Measuring the change in reactivity of a single molecule: Does The Bottom Effect The Top?*

Lateral forces, friction, and energy dissipation

Chair: Schwarz, U.

14:00 **Nam, S.** *The importance of the dipole at the metal tip apex when approaching closer with a CO tip.*

14:20 **Ollier, A.** *Energy dissipation on twisted bilayer graphene at magic angle twist.*

14:40 **Song, Y.** *Superlubric sliding in atomic friction in the case of molybdenum disulfide on gold.*

Characterisation of molecular systems (A)

Chair: Pawlak, R.

16:00 **Ihle, A.** *Tuning Halogen Bond Directed Self-Assembly: Substrate Snapping vs Intermolecular Interactions.*

16:20 **Ventura-Macias, E.** *Identifying CO_2 adsorption defects on Au surfaces with HR-AFM and STM.*

16:40 **Loppacher, C.** *[4+4] Photodymerization of Tripticene Derivatives with Anthracene Blades on Ionic Crystal Substrates.*

17:00 **Li, C.** *JT-SPM study of electron acceptor molecules on Ag(111).*

Thursday, August 4th 2022

Oxide surfaces

Chair: Setvín, M.

09:00 **Wrana, D.** *Ferroelectricity on oxide perovskite surfaces.*

09:20 **Sokolović, I.** *Charge trapping on a truly bulk-terminated $SrTiO_3$(001).*

09:40 **Heggemann, J.** *The (2×1) reconstruction of calcite(104).*

10:00 **Li, Y.-J.** *CO oxidation on Au adatom on oxidized rutile TiO_2 surface.*

2D materials

Chair: Temirov, R.

11:00 **Telychko, M.** *Sub-angstrom noninvasive imaging of atomic arrangement in 2D hybrid perovskites.*

11:20 **Gou, J.** *Observation of monoelemental ferroelectrics by scanning probe microscopy.*

11:40 **Behn, W.** *Tuning and measuring the potential landscape in 2D materials.*

12:00 **Spiegelberg, J.** *Spatially Resolved Nonlinear Optical Response in 2D WS_2.*

Friday, August 5th 2022

Characterisation of molecular systems (B)

Chair: Pérez, R.

09:00 **Scherb, S.** *Tuning thermal expansion of supramolecular networks by alkyl chain modification.*

09:20 **Laflör, L.** *The search for iron: NC-AFM imaging of the trimesic acid – iron self-assembled networks on Au(111).*

09:40 **Liu, J.-C.** *Proximity-Induced Superconductivity in Atomically Precise Nanographenes.*

10:00 **Pawlak, R.** *On-surface synthesis of nitrogen-doped nanographene characterized by low-temperature atomic force microscopy.*

Novel instrumentation and techniques (C)

Chair: Ebeling, D.

11:00 **de Campos Ferreira, R. C.** *Real Space Visualization of Entangled Excitonic States in Charged Molecular Assemblies.*

11:20 **Sekatskii, S.** *High spatial resolution PhotoThermal Induced Resonance imaging in visible spectral range based on Scanning Near-field Optical Microscope fibre probes and electronics.*

11:40 **Khachatryan, K.** *Understanding signal generation in NC-AFM with interferometric displacement detection.*

Closing remarks

12:00 **The organisers** *Closing remarks*

2 Poster contributions

Poster session A, Monday, August 1st 2022

P01 **Cai, Shuning** *Water-induced hydrogen-bond mismatch in a 2D supramolecular DNA bases assembly*

P03 **Temirov, Ruslan** *Design of an NC AFM operating at millikelvin temperatures: A progress report*

P05 **Rothe, Karl** *Atomic forces and relaxations in single-molecule reactions*

P07 **Qu, Zhang** *Atomic structure and electron distribution of ring-like Co cluster on Si(111) surface by NC-AFM/KPFM at 78 K*

P09 **Wang, Ziying** *Engineering Topological Phases in a Two-dimensional Transition Metal Dichalcogenide*

P11 **Xu, Chen** *Electrostatic Discovery Atomic Force Microscopy*

P13 **Jiuyan, Wei** *Study of Co adsorption model on Si(111)-7×7 surface using DFT calculation*

P15 **Balajka, Jan** *CO adsorption on Fe_3O_4(111) imaged by scanning probe microscopy*

P17 **Priante, Fabio** *Probing the structural details of cellulose and chitin nanocrystal-water interfaces by 3D-AFM*

P19 **Heile, Daniel** *Modelling nanoscale charge measurements*

P21 **Karimi, Amin** *Adsorption structures of mixed red-PTCDA and PTCDA on Ag(111)*

P23 **Schwarz, Alexander** *A novel method akin to magnetic force microscopy to sense tiny bio-magnetic fields using magnetically sensitive resonators*

P25 **Rothhardt, Daniel** *Local Work Function on Graphene Nanoribbons and on the Au(111) herringbone reconstruction*

P27 **Dierker, Tim** *Systematically mapping the distance-dependent tip-sample interaction for the PTCDA/Ag(111) system*

P29 **Wiesener, Philipp** *Atomic-scale characterization of triazine-based copper nitrides and their catalytic performance in an oxygen reduction reaction*

P31 **Ranawat, Yashasvi** *Workflow for prediction of hydration layers on surfaces*

Poster session B, Tuesday, August 2nd 2022

P16 **Weindl, Adrian** *Characterization of defects in the topological insulator Bi_2Se_3 at the picometer scale*

P18 **Heile, Daniel** *Measuring the charge state of a metal nanoparticle by the charge compensating bias method*

P20 **Guevara Parra, Jose Maria** *How covalent chemistry affects the surface dipole of metallic nanostructures*

P22 **Bustamante, José** *Electrostatic Force Microscopy to study single dopant atoms encapsulated in Silicon*

P24 **Suvachintak, Netaji** *Scanning Probe Force Microscopy on GaN/AlGaN based Nanowire*

P26 **Ritz, Christian** *Three-dimensional photoinduced force microscopy and its interpretation*

P28 **Choi, Hyoju** *Capillary Force Microscopy: A Novel Non-Contact Imaging Method*

P30 **Laflör, Linda** *Mapping the axial interaction forces with a carboxylic acid dimer*

P32 **Boisvert, Catherine** *Single Electron Spectroscopy on Metalloenzymes*

P34 **Koall, Maximilian** *Towards characterisation, exploration, and manipulation of molecules on surfaces with haptic feedback*

P36 see Tuesday, 10:00.

P38 **Lotze, Christian** *Resolution of Intramolecular Dipoles and a Push-Back Effect of Individual Molecules on a Metal Surface*

P40 **Vennema, Hester** *Performance of an electrically driven q-plus sensor in a commercial Joule Thomson STM*

P42 **Kumar, Saravana** *Does the electrostatic decay length in highly concentrated electrolytes increase with concentration?*

P44 **Godey, Sylvie** *Modification by electrical stimuli of molecular assemblies composed of azobenzene derivatives*

P46 **Liu, Danyang** *Cobalt nano-island growth on $Cu_3Au(111)$*

P48 **Kangül, Mustafa** *Open Source SPM Controller*

P50 **Zutter, Marco** *Analysis of Force Volume Data gathered with the Intermodulation AFM Method at Cryostatic Temperatures with a Tuning Fork*

	Sunday Jul 31st	Monday Aug 1st	Tuesday Aug 2nd	Wednesday Aug 3rd	Thursday Aug 4th	Friday Aug 5th
09:00 – 09:20		Registration	Priante	Setvín	Wrana	Scherb
09:20 – 09:40			Brown	Glatzel	Sokolović	Laflör
09:40 – 10:00			Yamamoto	Miyazaki	Heggemann	Liu
10:00 – 10:20			Jugade	Cowie	Li, Y.-J.	Pawlak
10:20 – 10:40		Coffee				
10:40 – 11:00						
11:00 – 11:20		**Welcome**	Sellies	Pérez	Telychko	de Campos Ferreira
11:20 – 11:40		Ebeling	Martin Jimenez	Vilhena	Gou	Sekatskii
11:40 – 12:00		Schwarz, U.	Sugawara	Gallardo	Behn	Khachatryan
12:00 – 12:20		Štich	Heile	Henry	Spiegelberg	**Closing remarks**
12:20 – 12:40		Lunch				
12:40 – 13:00						
13:00 – 13:20						
13:20 – 13:40						
13:40 – 14:00					**Excursions** (13:40–16:00)	
14:00 – 14:20		Zahl	da Lisca	Nam		
14:20 – 14:40		Eftekhari	Hoffmann-Vogel	Ollier		
14:40 – 15:00		Oinonen	Navarro Rodriguez	Song		
15:00 – 15:20		Coffee				
15:20 – 15:40						
15:40 – 16:00						
16:00 – 16:20	**Welcome reception** Fort Boven-Lent	Schwarz, A.	Su	Ihle		
16:20 – 16:40		Giessibl	Gisbert	Ventura-Macias		
16:40 – 17:00		Weiss	Siretanu	Loppacher		
17:00 – 17:20		Stilp	Ikarashi	Li, C.		
17:20 – 17:40						
17:40 – 18:00		Poster session A	Poster session B			
18:00 – 18:20					**Conf. photo** (18:15)	
18:20 – 18:40					**Dinner** Landgoed Brakkesteyn (18:30–22:30)	
18:40 – 19:00						
19:00 – 19:20						
19:20 – 19:30						