International Conference on Scanning Probe Microscopy (SPM-2017)

IOP Conference Series: Materials Science and Engineering Volume 256

Ekaterinburg, Russia 27 – 30 August 2017

ISBN: 978-1-5108-5033-0

ISSN: 1757-8981

Printed from e-media with permission by:

Curran Associates, Inc. 57 Morehouse Lane Red Hook, NY 12571



Some format issues inherent in the e-media version may also appear in this print version.

Copyright© (2017) by the Institute of Physics All rights reserved. The material featured in this book is subject to IOP copyright protection, unless otherwise indicated.

Printed by Curran Associates, Inc. (2017)

For permission requests, please contact the Institute of Physics at the address below.

Institute of Physics Dirac House, Temple Back Bristol BS1 6BE UK

Phone: 44 1 17 929 7481 Fax: 44 1 17 920 0979

techtracking@iop.org

Additional copies of this publication are available from:

Curran Associates, Inc. 57 Morehouse Lane Red Hook, NY 12571 USA

Phone: 845-758-0400 Fax: 845-758-2633

Email: curran@proceedings.com Web: www.proceedings.com

Table of contents

Volume 256

Scanning Probe Microscopy 2017 (SPM-2017) 27–30 August 2017, Ekaterinburg, Russian Federation

Accepted papers received: 8 October 2017

Published online: 20 October 2017

Preface

011001 OPEN ACCESS Scanning Probe Microscopy 2017 (SPM-2017)

011002 OPEN ACCESS Peer review statement

New Methods of Scanning Probe Microscopy

012001

OPEN ACCESS

Scanning probe nanolithography of resistive memory element based on titanium oxide memristor structures

V I Avilov, N V Polupanov, R V Tominov, V A Smirnov and O A Ageev.....1

012002

OPEN ACCESS

Optomechanical coupling between AFM cantilever and semiconductor laser

P A Alekseev, V A Sharov, A O Mikhaylov, M S Dunaevskii and A Baranov.....5

012003

OPEN ACCESS

Reducing the influence of the surface roughness on the hardness measurement using instrumented indentation test

I Maslenikov, A Useinov, A Birykov and V Reshetov.....10

012004

OPEN ACCESS

Multi-frequency data analysis in AFM by wavelet transform

V Pukhova and G Ferrini.....15

012005

OPEN ACCESS

<u>Investigation of photoconductivity of individual InAs/GaAs(001) quantum dots by Scanning Near-field Optical Microscopy</u>

D O Filatov, I A Kazantseva, N V Baidus', A P Gorshkov and V P Mishkin.....24

012006

OPEN ACCESS

The generation of the electrical oscillations in a contact of an AFM probe to an individual Au nanoparticle in a SiO₂/Si film

D O Filatov, O N Gorshkov, D A Antonov, M E Shenina, D Yu Sinutkin, A V Zenkevich and Yu A Matveev.....30

012007

OPEN ACCESS

Application of focused ion beam for the fabrication of AFM probes

A S Kolomiytsev, S A Lisitsyn, V A Smirnov, A A Fedotov and Yu N Varzarev.....35

012008

OPEN ACCESS

Thermal excitation contribution into the electromechanical performance of self-supported Gd-doped ceria membranes

A D Ushakov, E Mishuk, D O Alikin, B N Slautin, A A Esin, I S Baturin, V Ya Shur, I Lubomirsky and A L Kholkin....39

Scanning Probe Microscopy in Biology and Medicine

012009

OPEN ACCESS

The study of electrical conductivity of DNA molecules by scanning tunneling spectroscopy

T I Sharipov and R Z Bakhtizin.....45

012010

OPEN ACCESS

<u>Peculiarities of living cell response to the external stimuli revealed via quasistatic mode of atomic force microscopy</u>

M M Khalisov, A V Ankudinov, V A Penniyaynen, T E Timoshenko, K I Timoshchuk, M V Samsonov and V P Shirinsky.....49

012011

OPEN ACCESS

Formation features and AFM studies of the silicon-chitosan-containing glycerohydrogel surface

Yu Yu Zhuravleva, O N Malinkina, D N Bratashov and A B Shipovskaya.....55

012012

OPEN ACCESS

Local Young's moduli of as-grown and annealed diphenylalanine nanotubes

P S Zelenovskiy, V V Yuzhakov, S G Vasilev, A L Kholkin and V Ya Shur.....66

012013

OPEN ACCESS

High-speed precise cell patterning by pulsed electrohydrodynamic jet printing

A V Makaev, E A Mingaliev, V R Karpov, I V Zubarev, V Ya Shur and O S El'kina.....70

012014

OPEN ACCESS

Study of structural colour of *Hebomoia glaucippe* butterfly wing scales

V Ya Shur, D K Kuznetsov, V I Pryakhina, M S Kosobokov, I V Zubarev, S K Boymuradova and K V Volchetskaya.....76

012015

OPEN ACCESS

Combination of atomic force microscopy and mass spectrometry for the detection of target protein in the serum samples of children with autism spectrum disorders

A L Kaysheva, T O Pleshakova, A T Kopylov, I D Shumov, I Y Iourov, S G Vorsanova, Y B Yurov, V S Ziborov, A I Archakov and Y D Ivanov.....80

012016

OPEN ACCESS

Physical-mechanical image of the cell surface on the base of AFM data in contact mode

M N Starodubtseva, I E Starodubtsev, N I Yegorenkov, N S Kuzhel, E E Konstantinova and S A Chizhik.....83

Scanning Probe Microscopy in Materials Science

012017

OPEN ACCESS

AFM study of the supramolecular transformation of polyaniline and polyaniline/carbon nanotubes composite upon doping with dodecylbenzenesulfonic acid in the presence of a solvent

I A Lobov, N A Davletkildeev and D V Sokolov.....88

012018

OPEN ACCESS

Combination of scanning probe microscopy techniques for evaluating the electrical parameters of individual multiwalled carbon nanotubes

D V Sokolov, N A Davletkildeev, V V Bolotov and I A Lobov.....94

012019

OPEN ACCESS

Scanning probe microscopy in mineralogical studies: about origin of the observed roughness of natural silica-rich glasses

Ye A Golubev and S I Isaenko.....98

012020

OPEN ACCESS

Phase transitions in copper oxide thin films under proton irradiation

M M Dementyeva, K E Prikhodko, B A Gurovich, Z V Bukina, D A Komarov and L V Kutuzov.....105

012021

OPEN ACCESS

Study of the field emission graphene/SiC nanostructures using scanning probe microscopy

I L Jityaev, A M Svetlichnyi, A S Kolomiytsev, E Yu Volkov, V V Polyakova and O A Ageev.....110

SPM Analytical Methods and Probe Lithography

012022

OPEN ACCESS

<u>Tribological properties investigation of the thermoplastic elastomers surface with the AFM lateral forces mode</u>

T A Kuznetsova, T I Zubar, V A Lapitskaya, K A Sudzilouskaya, S A Chizhik, A L Didenko, V M Svetlichnyi, M E Vylegzhanina, V V Kudryavtsev and T E Sukhanova.....114

012023

OPEN ACCESS

<u>Profiling of nanostructures by scratching probe nanolithography and plasma chemical etching</u>

R V Tominov, V V Bespoludin, V S Klimin, V A Smirnov and O A Ageev.....120

012024

OPEN ACCESS

Piezoelectric effect in non-uniform strained carbon nanotubes

M V Ilina, Yu F Blinov, O I Ilin, N N Rudyk and O A Ageev.....124

Ferroics

012025

OPEN ACCESS

<u>In situ visualization of domain structure evolution during field cooling in 0.67PMN-0.33PT single crystal</u>

A D Ushakov, A A Esin, D S Chezganov, A P Turygin, A R Akhmatkhanov, Q Hu, L Sun, X Wei and V Ya Shur.....128

012026

OPEN ACCESS

Model for growth of fractal solid state surface and possibility of its verification by means of atomic force microscopy

D A Kulikov, A A Potapov, A E Rassadin and A V Stepanov.....133

012027

OPEN ACCESS

The phase-field modeling of the self-organized phase growth with three-fold symmetry

A R Akhmatkhanov, A I Lobov, M A Chuvakova, E D Saveliev and V Ya Shur.....142