

# GISAS Satellite Conference

Sunday, 20 September 2009 - Wednesday, 23 September 2009

DESY, Notkestr. 85, 22607 Hamburg, Bldg. 5 (Auditorium)



## Book of Abstracts



# Contents

Welcome by the director of Photon Science . . . . .	1
Welcome by the conference organizers . . . . .	1
GISANS and GISAXS for the analysis of magnetic nanostructures . . . . .	1
Macroscopic Arrays from Block Copolymers with Lateral Order . . . . .	1
Detailed GISAXS Analysis of Nanostructures in Thin Films of Block Copolymers using Synchrotron Radiation Source . . . . .	1
GISANS on magnetic nanostructures . . . . .	1
GISANS on magnetic nanostructures . . . . .	1
GISAXS on Magnetic Alloy Nanostructures . . . . .	2
Visualizing the self-assembled growth of a magnetic antidot array . . . . .	2
Specular and off-specular scattering of neutrons from Si/Fe multilayers . . . . .	2
Gracing Incidence Small Angle X-ray Scattering Data and Simulations of Colloidal Multi- layer . . . . .	2
Investigation of the growth of Ge islands on nominal and patterned Si(001) substrates . .	2
Uniaxially Oriented, Highly Ordered Superstructures of Discotic Supramolecules on Sub- strates over a Centimeter Length Scale . . . . .	2
Self-Assembly of Mesoporous Materials on Surfaces . . . . .	2
Effect of cap layer roughness on the GISAXS pattern from nanodots and its application to InAs nanodots capped with thin layers . . . . .	3
Large-scale homogenous ordered arrays of nanoparticles deposited via modified Langmuir- Blodgett technique . . . . .	3
Buried interfaces in the light of GISANS and neutron reflectivity . . . . .	3
Study of the Self-Ordering of Cobalt Nanoparticles . . . . .	3
The solid-liquid boundary investigated by neutron scattering . . . . .	3
GISANS on Surface Induced Order in Microemulsions . . . . .	3

Three-Dimensional Small-Angle scattering and Film Surface Reflection . . . . .	3
Reentrant Condensation of Proteins: Charge-Driven Interactions Beyond Mean-Field Behaviour . . . . .	3
Interaction of Synaptic Vesicles with Lipid Monolayers: A Structural Investigation by X-ray Reflectivity and GISAXS . . . . .	4
Phase transformation and local Ordering of Proteins on Surfaces . . . . .	4
Nano- and MicroGISAX for LB protein nanofilms and LB nanotemplate protein crystallization study . . . . .	4
Kinetics and Structure of Two-Dimensional Nanocrystal Superlattices by Grazing-Incidence Small- Angle X-ray Scattering . . . . .	4
Small Molecule-Directed Hierarchical Assemblies of Nanoparticles . . . . .	4
Formation of lateral structures in diblock copolymer films by vapor treatment . . . . .	4
Grazing Incidence Small-Angle X-ray Scattering Studies on FCC and BCC lattice Structures for Spherical Microdomains in Block Copolymer Thin Films . . . . .	4
A GISAXS Study of Columnar Discotic Liquid Crystals in Thin Films on Substrates . . . . .	5
Structural changes and charge transport properties of annealed P3HT / F8TBT solar cells . . . . .	5
Combining imaging ellipsometry with GISAXS for an in situ characterization of nanostructures . . . . .	5
Simultaneous spatial and energy-resolved SAXS and GISAXS measurements using a new pnCCD detector . . . . .	5
A Dedicated Instrument for GISAXS: Beamline 8-ID-E of the APS . . . . .	5
Pulsed Laser Deposition of Germanium using Nano-Pulse Lengths . . . . .	5
Combining GISAXS with in situ techniques to unravel optical and chemical properties of nanoparticles . . . . .	5
GISAXS from nanoparticles deposited on rippled dielectric surfaces: self-organization and correlated roughness effects . . . . .	6
Morphological Studies of Bulk Hetero-junction Organic Solar Cells . . . . .	6
Development of Microbeam GISAXS Tomography . . . . .	6
AGISAXS study of Carbon-encapsulated Au & Cu clusters: methodologies to separate the different contributions . . . . .	6
GISAXS experiments on integrated templated functional oxide materials . . . . .	6
Solving surface induced crystal structures of organic molecules . . . . .	6
Design and Performance of the Horizontal Reflectometer REFSANS at FRM II . . . . .	6
Interplay between Coherent and Incoherent Averaging in Scattering at Grazing Incidence . . . . .	7

Coherent Diffraction Imaging of Nanoislands in GISAXS Experiments . . . . .	7
Ion induced nanopattern formation on GaSb(001) studied with X-ray photon correlation spectroscopy . . . . .	7
Surface Dynamics studied by X-Ray Photon Correlation Spectroscopy in GISAXS mode .	7
Thin Film Kinetics in Soft Materials under Solvent Vapour . . . . .	7
Fabrication of Magnetic Nanodot Arrays using Diblock Copolymer Micelles as Templates	7
In-situ GISAXS Study of Gold Film Growth on a Conductive Polymer Film . . . . .	7
Development of in-situ heated Yttria-stabilised Zirconia thin film . . . . .	8



**Welcome / 0**

## **Welcome by the director of Photon Science**

**Author:** Edgar Weckert<sup>1</sup>

<sup>1</sup> *DESY*

**Welcome / 1**

## **Welcome by the conference organizers**

**Author:** Stephan V. Roth<sup>1</sup>

<sup>1</sup> *DESY*

2

## **GISANS and GISAXS for the analysis of magnetic nanostructures**

Keynote lecture 1

3

## **Macroscopic Arrays from Block Copolymers with Lateral Order**

Keynote lecture 2

4

## **Detailed GISAXS Analysis of Nanostructures in Thin Films of Block Copolymers using Synchrotron Radiation Source**

Keynote lecture 3

5

## **GISANS on magnetic nanostructures**

**Session 1 - MAGNETIC THIN FILMS / 6**

## **GISANS on magnetic nanostructures**

Session 1 - MAGNETIC THIN FILMS / 7

### **GISAXS on Magnetic Alloy Nanostructures**

Session 1 - MAGNETIC THIN FILMS / 8

### **Visualizing the self-assembled growth of a magnetic antidot array**

Session 1 continued - MAGNETIC THIN FILMS / 9

### **Specular and off-specular scattering of neutrons from Si/Fe multilayers**

Session 2 - NEW MATERIALS / 10

### **Gracing Incidence Small Angle X-ray Scattering Data and Simulations of Colloidal Multilayer**

Session 2 - NEW MATERIALS / 11

### **Investigation of the growth of Ge islands on nominal and patterned Si(001) substrates**

Session 2 - NEW MATERIALS / 12

### **Uniaxially Oriented, Highly Ordered Superstructures of Discotic Supramolecules on Substrates over a Centimeter Length Scale**

Session 2 - NEW MATERIALS / 13

### **Self-Assembly of Mesoporous Materials on Surfaces**



**Session 2 continued - NEW MATERIALS / 14**

**Effect of cap layer roughness on the GISAXS pattern from nanodots and its application to InAs nanodots capped with thin layers**

**Session 2 continued - NEW MATERIALS / 15**

**Large-scale homogenous ordered arrays of nanoparticles deposited via modified Langmuir-Blodgett technique**

**Session 3 - NEUTRONS / 16**

**Buried interfaces in the light of GISANS and neutron reflectivity**

**Session 3 - NEUTRONS / 17**

**Study of the Self-Ordering of Cobalt Nanoparticles**

**Session 3 - NEUTRONS / 18**

**The solid-liquid boundary investigated by neutron scattering**

**Session 3 - NEUTRONS / 19**

**GISANS on Surface Induced Order in Microemulsions**

**Session 3 - NEUTRONS / 20**

**Three-Dimensional Small-Angle scattering and Film Surface Reflection**

**Session 4 - BIOGISAS / 21**

## **Reentrant Condensation of Proteins: Charge-Driven Interactions Beyond Mean-Field Behaviour**

Session 4 - BIOGISAS / 22

## **Interaction of Synaptic Vesicles with Lipid Monolayers: A Structural Investigation by X-ray Reflectivity and GISAXS**

Session 4 continued - BIOGISAS / 23

## **Phase transformation and local Ordering of Proteins on Surfaces**

Session 4 continued - BIOGISAS / 24

## **Nano- and MicroGISAX for LB protein nanofilms and LB nanotemplate protein crystallization study**

Session 4 continued - BIOGISAS / 25

## **Kinetics and Structure of Two-Dimensional Nanocrystal Superlattices by Grazing-Incidence Small- Angle X-ray Scattering**

Session 5 - POLYMER SOFT MATTER / 26

## **Small Molecule-Directed Hierarchical Assemblies of Nanoparticles**

Session 5 - POLYMER SOFT MATTER / 27

## **Formation of lateral structures in diblock copolymer films by vapor treatment**

Session 5 continued - POLYMER SM / 28

## **Grazing Incidence Small-Angle X-ray Scattering Studies on FCC**

## **and BCC lattice Structures for Spherical Microdomains in Block Copolymer Thin Films**

Session 5 continued - POLYMER SM / 29

## **A GISAXS Study of Columnar Discotic Liquid Crystals in Thin Films on Substrates**

Session 5 continued - POLYMER SM / 30

## **Structural changes and charge transport properties of annealed P3HT / F8TBT solar cells**

Session 6 - NEW DEVELOPMENTS / 31

## **Combining imaging ellipsometry with GISAXS for an in situ characterization of nanostructures**

Session 6 - NEW DEVELOPMENTS / 32

## **Simultaneous spatial and energy-resolved SAXS and GISAXS measurements using a new pnCCD detector**

Session 6 - NEW DEVELOPMENTS / 33

## **A Dedicated Instrument for GISAXS: Beamline 8-ID-E of the APS**

**Author:** Joseph Strzalka<sup>1</sup>

<sup>1</sup> *Argonne National Laboratory*

Session 6 - NEW DEVELOPMENTS / 34

## **Pulsed Laser Deposition of Germanium using Nano-Pulse Lengths**

**Session 7 - MODELLING / 35**

**Combining GISAXS with in situ techniques to unravel optical and chemical properties of nanoparticles**

**Session 7 - MODELLING / 36**

**GISAXS from nanoparticles deposited on rippled dielectric surfaces: self-organization and correlated roughness effects**

**Session 11 - NEW MATERIALS (FUTURE DIRECTIONS) / 37**

**Morphological Studies of Bulk Hetero-junction Organic Solar Cells**

**Session 8 - NANOCOMPOSITES / 38**

**Development of Microbeam GISAXS Tomography**

**Session 8 - NANOCOMPOSITES / 39**

**AGISAXS study of Carbon-encapsulated Au & Cu clusters: methodologies to separate the different contributions**

**Session 8 continued - NANOCOMPOSITES / 40**

**GISAXS experiments on integrated templated functional oxide materials**

**Session 11 - NEW MATERIALS (FUTURE DIRECTIONS) / 41**

**Solving surface induced crystal structures of organic molecules**

**Session 11 - NEW MATERIALS (FUTURE DIRECTIONS) / 42**

## **Design and Performance of the Horizontal Reflectometer REF-SANS at FRM II**

Session 11 - NEW MATERIALS (FUTURE DIRECTIONS) / 43

### **Interplay between Coherent and Incoherent Averaging in Scattering at Grazing Incidence**

Session 10 - COHERENCE / 44

### **Coherent Diffraction Imaging of Nanoislands in GISAXS Experiments**

Session 10 - COHERENCE / 45

### **Ion induced nanopattern formation on GaSb(001) studied with X-ray photon correlation spectroscopy**

Session 10 - COHERENCE / 46

### **Surface Dynamics studied by X-Ray Photon Correlation Spectroscopy in GISAXS mode**

Session 9 - KINETICS / 47

### **Thin Film Kinetics in Soft Materials under Solvent Vapour**

Session 9 - KINETICS / 48

### **Fabrication of Magnetic Nanodot Arrays using Diblock Copolymer Micelles as Templates**

Session 9 - KINETICS / 49

### **In-situ GISAXS Study of Gold Film Growth on a Conductive Polymer Film**

**Session 9 - KINETICS / 50**

**Development of in-situ heated Ytria-stabilised Zirconia thin film**