

## Precision Ellipsometry for Studies of Molecular Interaction



### Dr Nikolai Yakovlev

Senior Scientist  
Institute of Materials Research and  
Engineering, A\*STAR

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**BTI Boardroom  
Level 6, Centros**

Hosted by Dr Terry Nguyen-Khuong

### Seminar Abstract

#### *Introduction*

Ellipsometry is analytical technique that determines properties of thin films by measuring changes of light polarisation reflected from the film. It gains its sensitivity by measuring phase shift between components of polarisation rather than intensity. Precision ellipsometry (PREL) uses polarisation modulator that makes it even more sensitive. With polarisation modulator designed and made in IMRE, PREL system has sensitivity in the range of microradians. This translates to sensitivity of 0.01 nm of organic layer on silicon.

#### *Applications*

In IMRE, PREL was used for quantitative real-time measurement of interactions, binding and unbinding of various molecules and multilayers, ranging from small molecules (amino-silane, tannic acid), polymers and polyelectrolytes to bio-molecules, proteins, antibodies and aptamers. The most recent innovation is imaging PREL, which enables measurement of selectivity and affinity of several receptors to one target molecule supplied in solution in one run. The results of these studies, findings and discoveries will be presented at the seminar.

#### *Live Demonstration*

In conclusion, portable PREL system in action and live measurement of molecular attachment will be demonstrated.

### About the Speaker

Nikolai Yakovlev obtained Ph.D. degree from Ioffe Physico-Technical Institute, Russia. He worked there in the area of magneto-optics. His work in IMRE started from surface studies using secondary ion mass spectrometry. At the same time, he developed optical techniques for surface analysis, such as precision ellipsometry, which will be the topic of the seminar.