

## Predicting and Measuring Nanomechanical Properties of Unique Hybrid Films

Sidney R. Cohen<sup>1</sup>, Katya Gotlib-Vainshtein<sup>2</sup>, Estelle Kalfon-Cohen<sup>1</sup>, Olga Girshevitz<sup>2</sup>, Chaim N. Sukenik<sup>2</sup>, David Barlam<sup>3</sup>

<sup>1</sup>Weizmann Institute of Science, Rehovot 76100 ISRAEL

<sup>2</sup>Bar Ilan University, Ramat-Gan 52900, ISRAEL

<sup>3</sup>Ben Gurion University, Beer Sheva, ISRAEL

Formation of nanoscale structures exhibiting desired physical and chemical properties is a relatively new, but exciting field of research. In this talk the characterization, and nanomechanical functionality of composite materials comprised of ultra-thin titania coatings on a PDMS substrate will be presented. This compound material expresses tunable stiffness and enhanced tribological characteristics. It will be shown that the properties of these materials can be predicted by a simple model, which predicts the observed mechanical behavior by considering only the film thickness and mechanical properties of the constitutive parts.