



# פרופ' אמיר שגיא - דיקן הפקולטה למדעי הטבע

בשיתוף עם

המחלקה לכימיה, המחלקה לפיסיקה  
והמכון לטכנולוגיה

מתכבד להזמין להרצאה של  
חתן פרס וולף בפיסיקה לשנת תשע"א

## Prof. Knut W. Urban

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For Microscopy and Spectroscopy with Electrons,  
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### Picometer Electron Microscopy

- An expedition into the world of atoms by aberration-corrected electron optics

The realization of aberration-corrected lenses has triggered a quantum jump in electron optics. The recent generation of transmission electron microscopes with aberration-corrected optics allows materials science in atomic dimensions and to measure individual atomic positions with picometer precision. This fulfils an old dream of condensed matter physics to derive macroscopic materials properties directly from observations on the atomic level. However in order to realize this ultra-high resolution it has to be accepted that optics in atomic dimensions is based on quantum physics and that the term "image" loses its conventional meaning. As a consequence access to the atomic-resolution information requires the numerical inversion of the non-linear imaging process by quantum-mechanical and optical image calculations on the basis of solutions of the Dirac equation. After a brief introduction into the basics of aberration-corrected electron optics and the physics of atomic-resolution microscopy studies on ferroelectric perovskitic oxides will be presented which provided new insight into the subtle atom relaxations forming the basis for the particular electronic properties of these materials.

יום ה', כב באייר תשע"א

26 במאי 2011, שעה 15:30

אודיטוריום בניין היי-טק (בניין 37 חדר 202)

לפני ההרצאה יוגש כיבוד קל

Thursday, 26 May 2011, 15:30

Alon building for Hi-Tech (37)

Auditorium 202

Refreshments will be served before the lectures