

Pavel Jelínek

Date of birth: 17.11.1972
Nationality: czech
Current position: Scientist

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Education:

1997- 2001 PhD. Study at the Czech Technical University, the field of study: Physical and Material Engineering. (the date of PhD. award: **22.1.2001**)

Doctoral Thesis: "*Modeling Influence of the Turbulent Flows in the Crystal Growth of II-VI Semiconductors.*"

1991-1997 M.Sc. study at the Czech Technical University

Awarded scholarship (3 years).

Master Thesis: "*Numerical Solution of Diffusive Equation in Two-dimensional Space.*"

Working experience:

1999 - at present:

Institute of Physics ASCR, department of Thin Films.

September 2001 - February 2005

PostDoc position in group of prof. F. Flores Sintas
Departamento de la Física Teórica de la Materia Condensada,
Universidad Autónoma de Madrid, Spain.

2008 (8 month)

visiting researcher (Fulbright Scholar)
Department of Physics and Astronomy
Arizona State University, USA

Research interests:

1. Development of ab-initio fast local orbital TB-MD-DFT FIREBALL code (<http://fireball.phys.wvu.edu/LewisGroup/fireballHome>)
2. Theoretical description of SPM methods (single atom manipulations, dissipative mechanism at atomic scale, chemical identification, imaging processes).
3. Ab initio simulations of the mechanical and the transport properties of nanostructures.
4. Transport processes in nanostructures and surfaces using Green's function formalism.
5. Dynamical processes and phase transition on semiconductor surfaces (e.g. SiC(100), Pb/Si(111)) using combination of kinetic Monte Carlo method and first principles DFT simulations.

Selected international collaborations:

- **University of Madrid**, Madrid, Spain. Prof. F. Flores, Theory of STM, metals on semiconductors.
- **Arizona State University**, USA, Prof. O.F. Sankey, ab initio DFT fast local orbital code Fireball development
- **West Virginia University**, USA, Prof. J.P. Lewis, development of ab initio DFT fast local orbital code Fireball; catalytic properties of TiO₂ surface
- **CSIC Instituto de Materiales**, Madrid, Spain. Dr. P. de Andres, first principles DFT simulations of surface reconstruction of TiO₂ surface.
- **Osaka University**, Osaka, Japan. Prof. S. Morita, atomic manipulations, chemical atomic identification on semiconductor surfaces using nc-AFM method.
- **IBM Almaden Research Center**, Dr. M. Ternes, USA, STM/AFM operating in the contact mode
- **University of Regensburg**, Prof. F.J. Giessibl, analysis of experimental data obtained by AFM/STM

Scholarship, Awards :

1. Ministerio de Educación, Cultura y Deporte, „Ayudas para la movilidad de profesores e investigadores españoles y extranjeros“, September 2004-February 2005
2. Otto Wichterle award for young outstanding researchers, Czech Academy of Science (2007)
3. Fulbright Scholarship (Arizona State University, 2008)

Professional Memberships:

1. Member of Fireball committee, fast local basis set TB-MD-DFT code (<http://fireball.phys.wvu.edu/LewisGroup/fireballHome>).
2. Member of the EUROCORES FANAS Review Panel
3. Guest Editor of Central European Journal of Physics

Referee: Physical Review (B,E), Physical Review Letters, Surface Science, Nanotechnology, Journal of American Chemical Society

Publications:

In total 23 publications with more than 200 citations; Science (1), Nature (1), Phys. Rev. Lett. (4) (~150 excluding self-citation)

Selected publications

1. Y. Sugimoto, P. Pou, M. Abe, **P. Jelinek**, R. Perez, S. Morita and O. Custance, "*Chemical identification of individual surface atoms by atomic force microscopy*" **Nature** **446**, 64 (2007). (**33** citations excluding self-citation)
2. Y. Sugimoto, P. Pou, O. Custance, **P. Jelinek**, M. Abe, R. Perez, S. Morita "*Complex Patterning by Vertical Interchange Atom Manipulation Using Atomic Force Microscopy*" **Science** **322**, 413 (2008). (**0** citations excluding self-citation)
3. **P. Jelinek**, R. Pérez, J. Ortega and F.Flores : "*H₂ dissociation over Au-nanowires and the fractional conductance quantum*" **Phys. Rev. Lett.** **96**, 046803 (2006). (**13** citation excluding self-citation)
4. N. Oyabu, P. Pou, Y. Sugimoto, **P. Jelinek**, M. Abe, S. Morita, R. Perez, O. Custance: "*Single Atomic Contact Adhesion and Dissipation in Dynamic Force Microscopy*" **Phys. Rev. Lett.** **96**, 106101 (2006). (**15** citation excluding self-citation)
5. Y. Sugimoto, **P. Jelinek**, P. Pou, S. Morita and O. Custance, R. Perez and M. Abe, "*Mechanism for room-temperature single atom lateral manipulations on semiconductors using dynamic force microscopy*" **Phys. Rev. Lett.** **98**, 106104 (2007). (**7** citation excluding self-citation)