# Curriculum Vitae

(last update: 30/10/2008 )

**Name**: Pavel **Surname**: Jelínek
**Date of birth**: 17.11.1972 **Nationality**: czech
**Current position**: Scientist
**Office address**:
Institute of Physics Czech Academy of Science
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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. Theory of the electronic structure calculation DFT; strongly correlated systems DMFT+LDA.
6. 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:**

1. **University of Madrid**, Madrid, Spain. Prof. F. Flores, Theory of STM, metals on semiconductors.
2. **Arizona State University, USA**, Prof. O.F. Sankey, ab inito DFT fast local orbital code FIREBALL development
3. **West Virginia University, USA**, Prof. J.P. Lewis, deveopment of ab inito DFT fast local orbital code FIREBALL; catalytic properties of $TiO_2$ surface
4. **CSIC Instituto de Materiales, Madrid, Spain.** Dr. P. de Andres, first principles DFT simulations of surface reconstruction of $TiO_2$ surface.
5. **Osaka University, Osaka, Japan.** Prof. S. Morita, atomic manipulations, chemical atomic identification on semiconductor surfaces using nc-AFM method.
6. **IBM Almaden Research Center**, Dr. M. Ternes, USA, STM/AFM operating in the contact mode
7. **Univerity 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 espanoles 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 commitee, 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

**Language skills:**

english - advance; spanish - advance; rusian - intermediate

**International & National Conferences**: 2 Plenary and 5 Invited talk

**Organization of International conferences**

1. Member of Organizing Committee of XI-th Symposium on Surface Physics, June 30 - July 4, 2008, Prague, Czech Republic.

**Publications:**

In total 22 publications with more than 200 citations; Science (1), Nature (1), Phys. Rev. Lett. (4) (~150 excluding self-citation)

## 10 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 Pattering by Vertical Interchange Atom Manipulation Using Atomic Force Microscopy*" **Science 322,** 413 (2008). (**0** citations excluding self-citation)
3. **P. Jelínek**, R. Peréz, J. Ortega and F.Flores : "*$H_2$ 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)
6. **P. Jelinek**, M. Svec, P.Pou, R. Perez and V. Chab, "*Tip-Induced Reduction of the Resonant Tunneling Current on Semiconductor Surfaces*" **Phys. Rev. Lett**. **101** 176101 (2008). (0 citation excluding self-citation)
7. **P. Jelínek**, R. Peréz, J. Ortega and F.Flores: "*First-principles simulations of the stretching and final breaking of Al nanowires: Mechanical properties and electrical conductance"* **Phys. Rev. B 68**, 085403 (2003). (**29** citation excluding self-citation)
8. **P. Jelínek,** H. Wang, J.P. Lewis, O. F. Sankey and J. Ortega: *"Multi-center approach to the exchange-correlation interactions in ab initio tight-binding methods"* **Phys. Rev. B 71**, 235101 (2005). **(20** citations excluding self-citation)
9. J. M. Blanco, C. González, **P. Jelínek**, J. Ortega, F. Flores, and R. Pérez: "*First-principles simulations of STM images: From tunneling to the contact regime*" **Phys. Rev. B 70**, 085405 (2004). (**16** citation excluding self-citation)
10. Y. Sugimoto, O. Custance, S. Morita, M. Abe, P. Pou, **P. Jelinek** and R. Pérez: "T*opographic and force spectroscopic study of the Sn/Si(111)-(√3x√3)R30º surface using atomic force microscopy*" **Phys.Rev. B 73**, 205329 (2006). (**10** citation excluding self-citation)