

Curriculum vitae

Name: Pavel **Surname:** Jelínek
Date of birth: 17.11.1972 **Nationality:** czech

Current position: senior scientist

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Education

2001 PhD. at the Czech Technical University, Material and Physical Engineering.

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

1997 Ing. at the Czech Technical University.

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

Working experience

1999 – at present: Institute of Physics of the AS CR, department of Thin Films.

2001 – 2005 PostDoc position in group of prof. F. Flores Sintas UAM, Spain

2008 (8 month) visiting researcher (Fulbright Scholar) O.F. Sankey ASU, USA

2009 – group leader of NANOSURF Laboratory in Institute of Physics of the AS CR (www.nanosurf.cz)

2014-2015 Visiting Professor Graduate School of Engineering, Osaka University

2015- UPOL Olomouc, Czech Republic

Research interests and outcomes

1. *Development of fast local orbital MD DFT FIREBALL code* (www.fireball-dft.org)

- Used by > 20 groups including USA, Germany, Switzerland, France, Spain, Argentina, China etc.
- Novel non-adiabatic molecular dynamics scheme
- Large scale DFT simulation up to thousands of atoms or *ns* time scale (see e.g. [review article](#))

2. *Theoretical description of Scanning Probe Microscopy*

- Understanding atomic contrast in nc-AFM/STM (e.g. [PRL\(2015\)](#), [Nat. Comm.\(2015, 2016\)](#), [PRL\(2016\)](#))
- Single atom chemical identification ([Nature\(2007\)](#); [ACS Nano\(2012\)](#))
- Novel mechanism of single atom manipulations on semiconductor surfaces ([Science\(2008\)](#), [PRL\(2007\)](#))
- Atomic contrast in KPFM ([PRL\(2009\)](#), [PRL\(2015\)](#))
- Dissipative mechanism at atomic scale ([PRL\(2006\)](#))
- Fundamental relation between the conductance and the binding force ([PRL\(2011\)](#) and [IOP LabTalk](#))

3. *Experimental investigation of surface and nanostructures by means of advanced UHV Scanning Probe Microscopy (simultaneous nc-AFM/STM; KPFM)*

- High-resolution AFM/STM imaging (Nat. Comm. (2016))
- Single atom chemical identification ([ACS Nano\(2012\)](#))
- Molecular recognition on semiconductor surfaces ([ACS Nano \(2013\)](#) and [here](#))
- nc-AFM/STM instrument development ([X-talk](#), [Qplus sensors](#))

4. *Experimental and theoretical studies of 2D materials*

- Doping graphene (ACS Nano ([2014](#), [2015](#)), [PRL\(2016\)](#))
- No silicene ([PRB\(2014\)](#))

Teaching activities

1. FJFI CVUT, Solid state physics
2. MFF UK. Selected chapters from Nanoelectronics
3. UPOL, Selected chapters from Nanoelectronics, Advanced scanning probe microscopy
4. PhD students: 2 defended; 5 actives

Professional Memberships & Services

1. Member of the International Advisory Board of Advanced Materials Interfaces Journal, Willey (2013-)
2. Member of the International Advisory Board J. Phys.: Cond. Mat., IoP publishing (2015-)
3. Member of FIREBALL committee, fast local basis set TB-MD-DFT code (www.fireball-dft.org).
4. Member of the EUROCORES FANAS Review Panel (2009-2012)

5. Reviewer of ERC Starting Grant
6. Member of Czech Grant Agency Review Panel (2013-2016)
7. Member of Programme (2009-2011) and Steering (2013-) Committee of International nc-AFM conference

Referee: Science, Nature Comm., Nano Letters, Physical Review Letters, Physical Review (B,E), ACS Nano, JACS etc.

Organization of International conferences

1. Member of Organizing Committee of XI-th Symposium on Surface Physics, July, 2008, Prague.
2. Organizer of two International Workshops “*Simultaneous STM/AFM measurements using tuning fork based sensors*”, Prague, October 2009 & 2010. (40 participants)
3. Co-chairman of ICFS-12 Prague, Czech Republic, July 2011 (more than 250 participants).
4. Co-chairman of dedicated Symposia ECOSS-28 Wroclaw, Poland, Aug-Sept. 2011.
5. Chairman of 15th nc-AFM, Cesky Krumlov, Czech Republic, July 2012 (more than 150 participants).

Prizes, Awards and Scholarships

1. Ministerio de Educación, Cultura y Deporte, „Ayudas para la movilidad de profesores e investigadores españoles y extranjeros“, Spain (2005).
2. Otto Wichterle award for young outstanding researchers, Czech Academy of Science (2007).
3. Fulbright Scholarship (2008).
4. The ASCR Prize for outstanding achievements of great scientific importance, Czech Academy of Sciences (2012).
5. Praemium Academiae, Czech Academy of Sciences (2016)

Publications

The PI published in total 81 publications with ~2900 citations, h-index 26 (Google Scholar) Science (1), Nature (1), Nature Chemistry (1), Nature Comm. (3), Phys. Rev. Lett. (14), ACS Nano (4), Nano Letters (1), JACS (1)

5 selected publications:

1. Y. Sugimoto et al, "[*Chemical identification of individual surface atoms by atomic force microscopy*](#)", **Nature** 446, 64 (2007).
2. P. Hapala, M. Svec, O. Stetsovykh, N. J. van der Heijden, M. Ondracek, J. van der Lit, P. Mutombo, I. Swart, P. Jelinek [*Mapping the electrostatic force field of single molecules from high-resolution scanning probe images*](#) **Nat. Commun.** 7 11560(1) - 11560(8) (2016).
3. F. Albrecht, J. Repp, M. Fleischmann, M. Scheer, M. Ondráček, P. Jelinek "[*Probing Charges on the Atomic Scale by Means of Atomic Force Microscopy*](#)", **Phys. Rev. Lett.** 115, 076101 (2015).
4. J. van der Lit, F. Di Cicco, P. Hapala, P. Jelinek, I. Swart "[*Submolecular Resolution Imaging of Molecules by Atomic Force Microscopy: The Influence of the Electrostatic Force*](#)", **Phys. Rev. Lett.** 116, 096102 (2016).
5. P. Hapala et al, "[*Origin of High-Resolution IETS-STM Images of Organic Molecules with Functionalized Tips*](#)", **Phys. Rev. Lett.** 113, 226101 (2014).

Invited presentations to international conferences and schools

In total 3 plenary and > 30 invited contributions on international conferences and schools

5 selected invited talks

1. IVC-19/ICSS-15 & ICN+T 2013, Paris, France, September 2013
2. 2015 NIMS conference, Tsukuba, Japan, July 2015
3. EMRS Fall Meeting, Warsaw, Poland, September 2015
4. DPG Spring meeting, Regensburg, Germany, March 2016
5. AVS Meeting, Nashville, USA, November 2016