

Dr. Dmitry Yu. Usachov

Curriculum Vitae



Contact information

Position: Assistant professor (docent)
Affiliation: Solid State Electronics department,
Physical Faculty,
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Education

2010 PhD degree in physics in St. Petersburg State University, Russia.
Thesis: "Electronic structure and morphology of graphene,
synthesized on single-crystalline surfaces of Ni and Co"
2007 Master's degree in physics (with honor)
Specialization: Semiconductor physics, Microelectronics, Physical
Electronics.
Thesis: "Investigation of the band structure of geometrically
nonuniform surfaces by means of angle-resolved photoelectron
spectroscopy"

Teaching activities

2011-2015 Lecturing at St. Petersburg State University:
"Methods of surface analysis",
"Emission spectroscopy of surfaces",
"Experimental methods of physical electronics".

Professional interests

Electronic structure of low-dimensional materials, in particular graphene and h-BN on metals. Tuning of the electronic properties of graphene by doping and controllable interaction with the substrate material. Application of photoemission and scanning probe techniques for analysis of structural and electronic properties of 2D systems.

Experimental methods: ARPES, XPS, NEXAFS, STM, AFM, LEED, synchrotron radiation techniques.

Awards

Award of the Saint Petersburg State University "For contributions to the science of young researchers" (2013)

Publication activity

Number of publications (articles): 45
H-index (WOS): 10
Researcher ID: G-9878-2013, <http://www.researcherid.com/rid/G-9878-2013>
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Main recent publications

- D.Yu. Usachov, A.V. Fedorov, A.E. Petukhov, O.Yu. Vilkov, A.G. Rybkin, M.M. Otrokov, A. Arnau, E.V. Chulkov, L.V. Yashina, M.Farjam, V.K. Adamchuk, B.V. Senkovskiy, C. Laubschat, and D.V. Vyalikh. "Epitaxial B-Graphene: Large-Scale Growth and Atomic Structure." ACS Nano **9**, 7314-7322 (2015). <http://pubs.acs.org/doi/abs/10.1021/acsnano.5b02322>
- Dmitry Usachov, Alexander Fedorov, Mikhail M. Otrokov, Alla Chikina, Oleg Vilkov, Anatoly Petukhov, Artem G. Rybkin, Yury M. Koroteev, Evgueni V. Chulkov, Vera K. Adamchuk, Alexander Grüneis, Clemens Laubschat, and Denis V. Vyalikh. "Observation of single-spin Dirac fermions at the graphene/ferromagnet interface." Nano Letters **15**, 2396-2401 (2015). <http://pubs.acs.org/doi/abs/10.1021/nl504693u>
- Elmar Yu. Kataev, Daniil M. Itkis, Alexander V. Fedorov, Boris V. Senkovsky, Dmitry Yu. Usachov, Nikolay I. Verbitskiy, Alexander Grüneis, Alexei Barinov, Daria Yu. Tsukanova, Andrey A. Volykhov, Kirill V. Mironovich, Victor A. Krivchenko, Maksim G. Rybin, Elena D. Obraztsova, Clemens Laubschat, Denis V. Vyalikh, and Lada V. Yashina. "Oxygen Reduction by Lithiated Graphene and Graphene-Based Materials." ACS Nano **9**, 320-326 (2015). <http://pubs.acs.org/doi/pdf/10.1021/nn5052103>
- Dmitry Usachov, Alexander Fedorov, Oleg Vilkov, Boris Senkovskiy, Vera K. Adamchuk, Lada V. Yashina, Andrey A. Volykhov, Mani Farjam, Nikolay I. Verbitskiy, Alexander Grüneis, Clemens Laubschat, and Denis V. Vyalikh. "The Chemistry of Imperfections in N-Graphene." Nano Lett. **14**, 4982-4988 (2014). <http://pubs.acs.org/doi/abs/10.1021/nl501389h>
- A.V. Fedorov, N.I. Verbitskiy, D. Haberer, C. Struzzi, L. Petaccia, D. Usachov, O.Y. Vilkov, D.V. Vyalikh, J. Fink, M. Knupfer, B. Büchner and A. Grüneis. "Observation of a universal donor-dependent vibrational mode in graphene." Nature Communications **5**, 3257 (2014). www.nature.com/articles/ncomms4257
- A. Paris, N. I. Verbitskiy, A. Nefedov, Y. Wang, A. V. Fedorov, D. Haberer, M. Oehzelt, L. Petaccia, D. Usachov, D.V. Vyalikh, H. Sachdev, C. Wöll, M. Knupfer, B. Büchner, L. Calliari, L. V. Yashina, S. Irle, and A. Grüneis. Kinetic isotope effect in the hydrogenation and deuteration of graphene. Advanced Functional Materials **23**, 1628–1635 (2013). <http://onlinelibrary.wiley.com/doi/10.1002/adfm.201202355/pdf>
- D. Usachov, A. Fedorov, O. Vilkov, V. K. Adamchuk, L. V. Yashina, L. Bondarenko, A. A. Saranin, A. Grüneis, and D. V. Vyalikh. Experimental and computational insight into the properties of the lattice mismatched structures: monolayers of h-BN and graphene on Ir(111). Phys. Rev. B **86**, 155151 (2012).
- D. Usachov, O. Vilkov, A. Grüneis, D. Haberer, A. Fedorov, V. K. Adamchuk, A. B. Preobrajenski, P. Dudin, A. Barinov, M. Oehzelt, C. Laubschat, and D. V. Vyalikh. "Nitrogen-doped graphene: efficient growth, structure and electronic properties". Nano Lett. **11**, pp 5401–5407 (2011). <http://pubs.acs.org/doi/abs/10.1021/nl2031037>
- D. Haberer, C.E. Giusca, Y. Wang, H. Sachdev, A.V. Fedorov, M. Farjam, S.A. Jafari, D.V. Vyalikh, D. Usachov, X. Liu, U. Treske, M. Grobosch, O. Vilkov, V.K. Adamchuk, S. Irle, S.R.P. Silva, M. Knupfer, B. Büchner, and A. Grüneis. Evidence for a New Two-Dimensional C4H-Type Polymer Based on Hydrogenated Graphene. Adv. Mater. **23**, 4497–4503 (2011).
- D. Usachov, V.K. Adamchuk, D. Haberer, A. Grüneis, H. Sachdev, A.B. Preobrajenski, C. Laubschat and D.V. Vyalikh. "Quasifreestanding, single-layer hexagonal boron nitride as a substrate for graphene synthesis", Phys. Rev. B **82**, 075415 (2010) [Editor's suggestion]