



Petr Stepanov

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SUMMARY

•Condensed Matter Physics •Physics •Trilayer Graphene
•Monolayer Graphene •Spin-Superfluid •Instrument control with
IEEE-488 •Software engineering •Data analysis

GRADUATE LEVEL COURSES

•205 Classical Mechanics •210 Electromagnetic Theory •212
Thermodynamics and Statistical Mechanics •221 Quantum
Mechanics •231 Methods for Theoretical Physics •234 Physics of
Nanoscale Systems •240 Condensed Matter Physics

EXPERIENCE

*Graduate Student Researcher, The Ohio State
University*
Columbus, OH — current to 2018

Experimental studies of electronic properties of 2D materials and
their applications.

Accomplishments

- Long-distance spin transport in graphene anti-ferromagnets.

EDUCATION

Moscow Institute of Physics and
Technology, Russia — Bachelor
of Science: Applied Physics and
Mathematics, 2010.

Moscow Institute of Physics and
Technology, Russia — Master of
Science: Applied Physics and
Mathematics, 2012.


University of California, Riverside,
CA — graduate student: Physics,
2012 - 2016.

The Ohio State University,
Columbus, OH — PhD candidate:
Physics, current - 2018.

SELECTED SKILLS

Lab skills: Nanofabrication (full
cycle), AFM, Raman
Spectroscopy, TEM, He³
cryostats.

Programming languages and
tools: Igor Pro, OriginLab, C/C++,
Python, Objective-C, Swift,
Blender, DesignCAD, MySQL,
LabVIEW.



Graduate Student Researcher, University of California, Riverside

Riverside, CA — 2012 to 2016

Experimental studies of electronic properties of 2D materials and their applications.

Accomplishments

- Quantum Hall Effect in 2D multi-band heterostructures.
- Phase diagrams in 2D multi-band heterostructures.
- Transport properties of 2D semiconductor materials (TMD's, InSe, etc.).
- Spin-superfluid experimental research (SHINES center).

Researcher, Technological Institute for Superhard and Novel Carbon Materials

Troitsk, Moscow Region, Russia — Sep 2009 to June 2012

Experimental studies of nanocomposite materials and their applications.

Accomplishments

- Successful improvement of thermoelectric properties of $\text{Bi}_{2-x}\text{Sb}_x\text{Te}_3$ based nanocomposite materials.

Exchange Visitor, Arizona State University

Tempe, AZ — Sep 2011 to Dec 2011

Accomplishments

- Experimental studies of thickness dependence of photo and thermionic emission from nitrogen-doped diamond thin films.

ADDITIONAL

- Matlab, •Mathematica, •LaTeX, •Igor Pro
- Cryptography •Hardware security •Software security •Usable security •Introduction to swift programming •iOS app development basics •Foundations of objective-C app development
- C/C++ •Python, •Python/Selenium package •Python socket programming •Objective-C •Swift •MySQL •LabVIEW
- Windows (since 98) •OS X, macOS •Unix/Linux •iOS.

ACHIEVEMENTS

- Benjamin C. Shen Award for outstanding 3rd year graduate student. UCR. 2015
- Innovation and development foundation award. MIPT. 2007-2009
- Russian National High School Physics Olympiad (regional level) – 1st prize. 2006
- Russian National High School Mathematics Olympiad (regional level) – 4th prize. 2006



SELECTED PUBLICATIONS

- “Tunable Symmetries of Integer and Fractional Quantum Hall Phases in Heterostructures with Multiple Dirac Bands.” Petr Stepanov, Yafis Barlas, Tim Espiritu, Shi Che, Kenji Watanabe, Takashi Taniguchi, Dmitry Smirnov, and Chun Ning Lau. *Phys. Rev. Lett.*, **117**, 076807. 2016
- “Ionic Liquid Gating of Suspended MoS₂ Field Effect Transistor Devices.” Fenglin Wang, Petr Stepanov, Mason Gray, Chun Ning Lau, Mikhail E. Itkis, Robert C. Haddon. *Nano Lett.*, 2015, **15**(8), pp. 5284-5288. 2015
- “Annealing and Transport Studies of Suspended Molybdenum Disulfide Devices.” Fenglin Wang, Petr Stepanov, Mason Gray and Chun Ning Lau. *Nanotechnology*, **26**(10). 2015
- “Energy Gaps and Layer Polarization of Integer and Fractional Quantum Hall States in Bilayer Graphene.” Yanmeng Shi, Yongjin Lee, Shi Che, Ziqi Pi, Timothy Espiritu, Petr Stepanov, Dmitry Smirnov, Chun Ning Lau, and Fan Zhang. *Phys. Rev. Lett.*, **116**, 056601. 2016
- “Interface and interlayer barrier effects on photo-induced electron emission from low work function diamond films.” Tianyin Sun, Franz A. M. Koeck, Petr B. Stepanov, Robert J. Nemanich. *Diamond and Related Mat.*, **44**, pp. 123-128. 2014
- “C₆₀-doping of nanostructured Bi–Sb–Te thermoelectrics.” Mikhail Popov, Sergei Buga, Phillipp Vysikaylo, Petr Stepanov, Vasili Skok, Viacheslav Medvedev, Evgeny Tatyatin, Viktor Denisov, Alexei Kirichenko, Viktor Aksenkov, Vladimir Blank. *Phys. Status Solidi A*, **208**, pp. 2783–2789. 2011
- “Thermoelectric properties of Bi_{0.5}Sb_{1.5}Te₃/C₆₀ nanocomposites.” Vladimir Blank, Sergei Buga, Vladimir Kulbachinskii, Vladimir Kytin, Viacheslav Medvedev, Mikhail Popov, Petr Stepanov, Vasili Skok. *Phys. Rev. B*, **86**, 075426. 2012
- “Composites of Bi_{2-x}Sb_xTe₃ nanocrystals and fullerene molecules for thermoelectricity.” Vladimir Kulbachinskii, Vladimir Kytin, Mikhail Popov, Sergei Buga, Petr Stepanov, Vladimir Blank. *Journal of Solid State Chemistry*, **193**, pp. 64-70. 2012



CONFERENCES

- “Symmetry protected topological phases in a multi-band 2D electron gas.” [Petr Stepanov](#), Yafis Barlas, Chun Ning Lau, Dmitry Smirnov Kenji Watanabe, Takashi Taniguchi. APS March Meeting 2016.
- “Quantum Hall Effect in ABA-stacked Trilayer Graphene.” [Petr Stepanov](#), Yafis Barlas, Takashi Taniguchi, Nathaniel Gillgren, Chung Ning Lau. Graphene Week 2015.
- “Quantum Hall Effect (QHE) in ABA-stacked Trilayer Graphene.” [Petr Stepanov](#), Yafis Barlas, Takashi Taniguchi, Nathaniel Gillgren, Chung Ning Lau. APS March Meeting 2015.
- “Suspended Molybdenum Disulfide Field Effect Transistors.” Fenglin Wang, [Petr Stepanov](#), Mason Gray and Chun Ning Lau. APS March Meeting 2015.
- “Annealing and ionic liquid gating on suspended molybdenum disulfide devices.” Fenglin Wang, [Petr Stepanov](#), Mason Gray and Chun Ning Lau. APS March Meeting 2015.
- “Transport Properties and Devices of Molybdenum Disulfide.” Fenglin Wang, [Petr Stepanov](#) and Chun Ning Lau. APS March Meeting 2014.
- “Measurement of energy gaps of integer and fractional quantum Hall states in suspended bilayer graphene devices.” Yanmeng Shi, Yongjin Lee, Shi Che, Ziqi Pi, Timothy Espiritu, Kevin S. Myhro, [Petr Stepanov](#), Nathaniel A. Gillgren Dmitry Smirnov, Chun Ning Lau, and Fan Zhang. APS March Meeting 2015.
- “Thermoelectric properties of Bi_{0.5}Sb_{1.5}Te₃/C₆₀ nanocomposites.” Vladimir Blank, Sergei Buga, Vladimir Kulbachinskii, Vladimir Kytin, Viacheslav Medvedev, Mikhail Popov, [Petr Stepanov](#), Vasilii Skok. Phys. Rev. B, **86**, 075426. 2012
- “Composites of Bi_{2-x}Sb_xTe₃ nanocrystals and fullerene molecules for thermoelectricity.” Vladimir Kulbachinskii, Vladimir Kytin, Mikhail Popov, Sergei Buga, [Petr Stepanov](#), Vladimir Blank. Journal of Solid State Chemistry, **193**, pp. 64-70. 2012

