

# Abhishek Grewal

---

CONTACT INFORMATION	<i>D.O.B.:</i> June 10, 1994 Möhringer Landstr. 11 DE 70563 Stuttgart Germany	<i>Phone:</i> +49 711 689-5208, +49 176 2332 8797 <i>Fax:</i> +49 711 689-1662 <i>E-mail:</i> a.grewal@fkf.mpg.de <i>Webpage:</i> <a href="https://www.fkf.mpg.de/person/49701/5302167">https://www.fkf.mpg.de/person/49701/5302167</a>
RESEARCH INTERESTS	Scanning tunneling microscopy (STM), single molecule optical spectroscopy, Hanbury Brown-Twiss interferometry, triplet state emission, physics for public policy	
EDUCATION	<b>Max Planck Institute for Solid State Research</b> , DE 70569 Stuttgart, Germany <b>École Polytechnique Fédérale de Lausanne</b> , CH 1015 Lausanne, Switzerland Ph.D. Candidate, Physics, January 2018 (expected graduation date: March 2022) <ul style="list-style-type: none"><li>• Dissertation Title (tentative): <i>STM-induced luminescence from single molecules</i></li><li>• Supervisor: Klaus Kern, Klaus Kuhnke</li></ul> <b>Max Planck Institute for Solid State Research</b> , DE 70569 Stuttgart, Germany <b>Universität Stuttgart</b> , DE 70569 Stuttgart, Germany M.Sc., Physics, October 2017 <ul style="list-style-type: none"><li>• Thesis Title: <i>Study of highly correlated systems on h-BN/Cu(111) using cryogenic STM/AFM</i></li><li>• Supervisor: Klaus Kern, Jörg Wrachtrup</li></ul> <b>University of Delhi</b> , IN-110007 New Delhi, India B.Sc., Physics, June 2015	
RESEARCH EXPERIENCE	<b>Max Planck Institute for Solid State Research</b> , DE 70569 Stuttgart, Germany <i>Graduate Student (Ph.D. Candidate)</i> <b>January 2018 - present</b> Low-temperature STM, Hanbury Brown-Twiss interferometry, time-resolved STM, triplet emitters, efficient solar energy conversion, tunnel junctions, and photon statistics <i>Research Assistant (Master's thesis)</i> <b>August 2016 - December 2017</b> Sub-Kelvin STM/AFM, qPlus sensor, KPFM, h-BN, magnetic atoms, Kondo effect, and precise physical and electronic characterization at nm scale <b>1. Physikalisches Institut, Universität Stuttgart</b> , DE 70569 Stuttgart, Germany <i>Research Assistant</i> <b>February - June 2016</b> Electron spin resonance measurements, cryogenics, and co-planar metallic resonators <ul style="list-style-type: none"><li>• Supervisor: Marc Scheffler, Martin Dressel</li></ul> <b>University of Delhi</b> , IN 110007 New Delhi, India <i>Research Assistant</i> <b>February - April 2015</b> Discrete dipole approximation method, surface plasmon resonance, and silver nanoparticles <ul style="list-style-type: none"><li>• Supervisor: Kuldeep Kumar Kapil</li></ul> <i>Research Assistant</i> <b>September - December 2014</b> Gutzwiller mean-field theory, 2D optical lattices, non-equilibrium dynamics, strongly-correlated bosons, and Mott insulator to superfluid phase transition <ul style="list-style-type: none"><li>• Supervisor: Sukanta Dutta, Mamta Dahiya</li></ul> <b>Indian Institute of Technology</b> , IN 247667 Roorkee, India	

Thin-film growth, PLD, SQUID measurements, functionalization using oxide layers

- Supervisor: Ramesh Chandra, Davinder Kaur

## PUBLICATIONS

1. Leon, C.\*, Rosławska, A.\*, Grewal, A., Gunnarsson, O., Kuhnke, K., and Kern, K. Photon super-bunching from a generic tunnel-junction. *Sci. Adv.* 2019; **5**: eaav4986.
2. Merino P., Rosławska, A., Leon, C., Grewal, A., Große, C., González, C., Kuhnke, K., and Kern, K. A Single Hydrogen Molecule as an Intensity Chopper in an Electrically Driven Plasmonic Nanocavity. *Nano Letters* **2019** 19(1), 235-241.

PAPERS IN  
PREPARATION

1. Grewal, A., Müinks, M., Wang, Y., Kern, K., and Ternes, M.. On local stiffness and work-function variation of CVD grown h-BN.
2. Leon, C., Rosławska, A., Grewal, A., Gunnarsson, O., de Oteyza, D., Kuhnke, K., and Kern, K. Photon anti-bunching in plasmonic emission by band-bending on organic semiconductor.

## SKILLS

- Scanning probe microscopy, vacuum technology, cryogenics, qPlus sensor, surface science, nanooptics, electron spin resonance, simulations
- Computer Skills:
  - Languages: C, C++, Python, MATLAB, some use of Unix shell scripts
  - Applications: Nanonis, Lightfield, COMSOL Multiphysics, Blender, L<sup>A</sup>T<sub>E</sub>X, LabVIEW, POV-Ray, AutoCAD, Adobe Photoshop, common Windows/Linux database, spreadsheet and presentation software
- Languages: English (first language), Hindi (first language), German (beginner)
- Hobbies: DIY electronics (table-top STM for physics lab), Blogging (physics outreach), Handball, Badminton

## REFERENCES

1. Prof. Dr. Klaus Kern  
*E-mail:* k.kern@fkf.mpg.de    *Phone:* +49 711 689-1660  
Max Planck Institute for Solid State Research, DE-70569 Stuttgart, Germany  
École Polytechnique Fédérale de Lausanne, CH-1015 Lausanne, Switzerland
2. Prof. Dr. Markus Ternes  
*E-mail:* ternes@physik.rwth-aachen.de    *Phone:* +49 241 80 27099  
2. Physikalisches Institut, RWTH Aachen, DE-52074 Aachen, Germany  
Peter Grünberg Institut (PGI-3), Forschungszentrum Jülich, DE-52425 Jülich, Germany
3. Assoc. Prof. Sukanta Dutta  
*E-mail:* sukanta.dutta@gmail.com    *Phone:* +91 98116 87970  
University of Delhi, IN-110007 New Delhi, India