Abhishek Grewal

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Research Interests

Nanooptics, time-resolved Scanning Probe Microscopy, exciton dynamics, plasmonics, single molecule spectroscopy

Education

Max Planck Institute for Solid State Research, Stuttgart, Germany
École Polytechnique Fédérale de Lausanne, Lausanne, Switzerland

Ph.D. Candidate, Physics, January 2018 (expected graduation date: March 2022)

Max Planck Institute for Solid State Research, Stuttgart, Germany
Universität Stuttgart, Stuttgart, Germany

M.Sc., Physics, October 2017
Thesis Title: *Study of highly correlated systems on h-BN/Cu(111) using cryogenic STM/AFM*

University of Delhi, New Delhi, India

B.Sc., Physics, June 2015

Research Experience

Max Planck Institute for Solid State Research, Stuttgart, Germany

Graduate Student (Ph.D. Candidate) **January 2018 - present**
STM-induced single molecule luminescence and exciton-plasmon dynamics

Research Assistant (Master's thesis) **August 2016 - December 2017**
sub-Kelvin STM/AFM, qPlus sensor, 2D materials, and Kondo effect

RIKEN (理化学研究所), Wakō-shi, Saitama, Japan

Visiting Researcher **January - March 2020**
single-molecule photoluminescence and electroluminescence, and inter-system crossing

1. Physikalisches Institut, Universität Stuttgart, Stuttgart, Germany

Research Assistant **February - June 2016**
electron spin resonance measurements, cryogenics, and co-planar metallic resonators

University of Delhi, New Delhi, India

Research Assistant **September 2014 - April 2015**
strongly-correlated bosons and Mott insulator to superfluid phase transition

Indian Institute of Technology, Roorkee, India

Internship **December 2013**
thin-film growth, PLD, SQUID measurements, functionalization using oxide layers

Skills

Nanooptics, Scanning probe microscopy, vacuum technology, cryogenics, surface science, mathematical modelling, Web desig, LaTeX, LabVIEW
Languages:
- Computing: Python, MATLAB, C++
- Spoken: English, Hindi, German (limited proficiency)

Activities

TEDxMPIStuttgart, Co-organizer **Feb 2018 - Nov 2019**
managed the planning and organizational tasks at the MPI Stuttgart chapter of TEDx conference

Nanoscale Science Journal Club, Organizer **Jun 2018 - Mar 2019**

planned and organized the activities of the department journal club

Publications

1. Leon, C. 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. 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.
3. Leon, C. C., Gunnarsson, O., de Oteyza, D. G., Rosławska, A., Merino, P., Grewal, A., Kuhnke, K., and Kern, K. Single Photon Emission from a Plasmonic Light Source Driven by a Local Field-Induced Coulomb Blockade. *ACS Nano* 2020 *14*(4), 4216-4223.
4. Lawrence, J., Brandimarte, P., Berdonces-Layunta, A., Mohammed, M. S. G., Grewal, A., Leon, C. C., Sánchez-Portal, D., and de Oteyza, D. G. Probing the Magnetism of Topological End States in 5-Armchair Graphene Nanoribbons. *ACS Nano* 2020 *14*(4), 4499-4508
5. Rosławska, A.*, Leon, C. C.*, Grewal, A., Merino, P., Kuhnke K., and Kern, K. Atomic-Scale Dynamics Probed by Photon Correlations. *ACS Nano* 2020 *14*(6), 6366-6375.