Hema Chandra Prakash Movva

CONTACT INFORMATION

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RESEARCH

Fabrication and electrical transport measurements of layered semiconductor devices

EDUCATION

The University of Texas at Austin, Austin, TX, USA — Ongoing
Ph.D., Electrical and Computer Engineering, Advisors: Sanjay Banerjee, Emanuel Tutuc

The University of Texas at Austin, Austin, TX, USA — May 2012
M.S.E., Electrical and Computer Engineering, Advisor: Sanjay Banerjee

Indian Institute of Technology Bombay, Mumbai, India — May 2009
B.Tech., Electrical Engineering, Thesis Advisor: Arun Chandorkar

HONORS AND AWARDS

Best Paper Award, Device Research Conference 2016

Best Poster Award, Device Research Conference 2015

Best Poster Award, International Nanotechnology Conference (INC9) 2013

Silver Medal at the 37^{th} International Physics Olympiad 2005

National Talent Search (NTSE) scholarship 2003

Kishore Vaigyanik Protsahan Yojana (KVPY) fellowship 2003-05

SELECTED PUBLICATIONS

HCP Movva, B Fallahazad, K Kim, S Larentis, T Taniguchi, K Watanabe, SK Banerjee, E Tutuc **Density-Dependent Quantum Hall States and Zeeman Splitting in Monolayer and Bilayer WSe_2**, *Phys. Rev. Lett.*, **118**, *247701* (2017)

A Roy, HCP Movva, B Satpati, K Kim, R Dey, A Rai, T Pramanik, S Guchhait, E Tutuc, SK Banerjee, **Structural and Electrical Properties of $MoTe_2$ and $MoSe_2$ Grown by Molecular Beam Epitaxy**, *ACS Appl. Mater. Interfaces*, **8**, *7396* (2016)

B Fallahazad, HCP Movva, K Kim, S Larentis, T Taniguchi, K Watanabe, SK Banerjee, E Tutuc **Shubnikov–de Haas Oscillations of High-Mobility Holes in Monolayer and Bilayer WSe_2: Landau Level Degeneracy, Effective Mass, and Negative Compressibility**, *Phys. Rev. Lett.*, **116**, *086601* (2016)

JH Park, HCP Movva, E Chagarov, K Sardashti, H Chou, I Kwak, KT Hu, SF Shirey, P Choudhury, SK Banerjee, AC Kummel, ***In Situ* Observation of Initial Stage in Dielectric Growth, and Deposition of Ultrahigh Nucleation Density Dielectric on Two-Dimensional Surfaces**, *Nano Lett.*, **15**, *6626* (2015)

HCP Movva, A Rai, S Kang, K Kim, B Fallahazad, T Taniguchi, K Watanabe, E Tutuc, SK Banerjee, **High-Mobility Holes in Dual-Gated WSe_2 Field-Effect Transistors**, *ACS Nano*, **9**, *10402* (2015)

HCP Movva, M Ramón, C Corbet, S Sonde, F Chowdhury, G Carpenter, E Tutuc, SK Banerjee, **Self-aligned graphene field-effect transistors with polyethyleneimine doped source/drain access regions**, *Appl. Phys. Lett.* **101**, *183113* (2012)

Full list at https://scholar.google.com/citations?user=c_IscTQAAAAJ&hl=en

Conference Presentations

HCP Movva, B Fallahazad, K Kim, S Larentis, T Taniguchi, K Watanabe, SK Banerjee, E Tutuc, **Carrier Density Dependent Quantum Hall States Sequence of Holes in WSe_2**, *APS March Meeting* **2017**

HCP Movva, S Kang, A Rai, K Kim, B Fallahazad, T Taniguchi, K Watanabe, E Tutuc, SK Banerjee, **Room Temperature Gate-tunable Negative Differential Resistance in MoS_2/hBN/WSe_2 Heterostructures**, *74th Device Research Conference* **2016**

HCP Movva, A Rai, S Kang, K Kim, S Guchhait, T Taniguchi, K Watanabe, E Tutuc, SK Banerjee, **Top-gated WSe_2 field-effect transistors with Pt contacts**, *73rd Device Research Conference* **2015**

HCP Movva, S Kang, A Rai, SK Banerjee, **Ambipolar conduction in MoS_2/WSe_2 heterobilayers**, *APS March Meeting* **2015**

HCP Movva, P Jadaun, LF Register, SK Banerjee, **Intercalated Bilayer Graphene Heterostructures towards the BiSFET**, *INC9* **2013**

HCP Movva, M Ramón, C Corbet, F Chowdhury, G Carpenter, E Tutuc, SK Banerjee, **Graphene field-effect transistors with self-aligned spin-on-doping of source/drain access regions**, *70th Device Research Conference* **2012**

Research Projects

Transition metal dichalcogenide heterostructures and FETs Jan 2014 - Present

Advisors: Sanjay Banerjee and Emanuel Tutuc Ph.D. research, UT Austin

Currently involved in fabricating heterostructures and FETs using atomically thin transition metal dichalcogenides for exploring tunneling, and many-body phenomena via transport measurements.

Intercalated graphene heterostructures Aug 2012 - Sep 2013

Advisor: Sanjay Banerjee Ph.D. research, UT Austin

Fabricated, and characterized intercalated bilayer graphene heterostructures using Raman spectroscopy, X-ray diffraction, and temperature dependent transport measurements.

Surface-transfer doping of graphene Jan 2011 - Feb 2012

Advisor: Sanjay Banerjee M.S.E. Thesis, UT Austin

Developed a novel scheme of fabricating graphene field effect transistors (GFETs) with self-aligned gates and chemically doped source/drain access regions, resulting in improved device performance.

Work Experience

Solar Semiconductor Inc., Hyderabad, India

Engineer R&D Jun 2009 - Aug 2010

Worked on modelling the wattage loss incurred in c-Si PV module manufacturing processes. Developed distributed circuit models for c-Si PV modules. Worked on characterization of sun-simulators.

Texas Instruments, Bangalore, India

Circuit Design Intern May 2008 - Aug 2008

Designed a high-speed dynamic latch based voltage comparator and devised a new characterization scheme for noise immunity. Built a 250 MSPS 6-bit SAR ADC using this comparator at its core.

Skills

Device fabrication: E-beam lithography, standard cleanroom processing
Device characterization: Probe stations, parameter analyzers, lock-in amps, He cryostats
Programming languages: Matlab/Scilab, LabVIEW, C/C++

Organizational Activities

President: Japan Karate Association of Austin 2013 - 2015
Co-ordinator: Techfest, IIT Bombay 2007
Organizer: *Aagomani*, Department of Electrical Engineering, IIT Bombay 2006