Mohammed Ali Aamir

Age: 22 years

Department of Physics
Indian Institute of Science
Bangalore - 560012, India

Email: mdaliaamir@gmail.com
aamir@physics.iisc.ernet.in
Mobile: +91 9535146033
Webpage: www.mdaliaamir.wordpress.com

Present

- Post-doctoral position in Department of Physics, Indian Institute of Science, Bangalore, India

Education

- **'O' levels** and **'A' levels**, passed by the age of 12 years. **2004 – 2006**
  London Qualifications, United Kingdom

- **BSc. (Honours) Physics**, from age 12 – 15 **2006 – 2009**
  St. Xavier's College, Kolkata, India

- **Integrated PhD.**, from age 15 – 22 **2009 – 2016**
  Department of Physics, Indian Institute of Science, Bangalore, India
  Advisor: *Prof. Arindam Ghosh*
  Dissertation: *Impact of disorder and topology in two dimensional systems at low carrier densities*

Grants and Awards

- **The Telegraph School Award for Excellence 2009**, for obtaining BSc. degree by age of 15 years.

- **Prof. M. A. Viswamitra Memorial Award 2011**, for best performance in PhD. course-work
  Department of Physics, Indian Institute of Science, Bangalore, India

- **Shyama Prasad Mukherjee Fellowship 2012**, awarded to only distinguished research students
  Council of Scientific & Industrial Research (CSIR), India

- **Kumari L. Meera Memorial Award 2013**, for highest CGPA in PhD. course-work
  Department of Physics, Indian Institute of Science, Bangalore, India

Research Experience

- Transport experiments in devices based on **GaAs/AlGaAs heterostructures** (obtained from the Semiconductor Physics group, Cavendish Lab)
  - Discovered linear magnetoresistance in the strongly pinched off regime
  - Demonstrated a uniquely tunable quantum dot lattice as an endeavor towards quantum simulation in a solid-state platform

- Transport experiments in **bilayer graphene** devices, especially at high electric fields
  - Measurement of very low conductance and its fluctuations in strongly gapped regime
  - First observation of log-normal distribution of conductance owing to strong carrier localization

- Evidence for non-universality of conductance fluctuations
- Systematic study of flicker noise in the gapped state

Research Skills

- A – Z fabrication of micron-scale devices based on 2D crystals, including its heterostructures
- E-beam lithography and its optimization
- Independent operation of dilution refrigerator (Leiden) and He3 system (Janis)
- Low noise electrical measurements in DC and AC, and of flicker noise
- Data acquisition and measurement automation with LabView
- Advanced data analysis and visualization with OriginPro and Matlab

Teaching Experience

Teaching assistant in Department of Physics, Indian Institute of Science, Bangalore, India for courses

- PH 208: Condensed Matter Physics (2012)
- PH 359: Physics at Nanoscale (2013)

Journal Publications

1. *Transport through an electrostatically defined quantum dot lattice in a two-dimensional electron gas,* Srijit Goswami, **M. A. Aamir** *et al.* Physical Review B, 85, 075427 (2012).

2. *Colossal nonsaturating linear magnetoresistance in two-dimensional electron systems at a GaAs/(Al,Ga)As heterointerface*, **M. A. Aamir** *et al.,* Physical Review B, 86, 081203(R) (2012).

3. *Log-normal distribution in strongly gapped bilayer graphene*, **M. A. Aamir** *et al.* (in preparation)

4. *Percolative transport in gapped bilayer graphene*, **M. A. Aamir** *et al.* (in preparation)

5. *Non-universality of conductance fluctuations in bilayer graphene*, **M. A. Aamir** *et al.* (in preparation)

Conference Publications

1. *Large linear magnetoresistance in a GaAs/AlGaAs heterostructure*, **Mohammed Ali Aamir** *et al.*, AIP Conference Proceedings 1566, 255 (2013).

2. *Electrostatic modulation of periodic potentials in a two-dimensional electron gas: from antidot lattice to quantum dot lattice*, Srijit Goswami, **Mohammed Ali Aamir** *et al.,* AIP Conference Proceedings 1566, 257 (2013).

Book Publications

- *Chapter 5: 2D van der Waals Hybrid: Structures, Properties and Devices*, **Md. Ali Aamir** *et al*., Book Chapter in 2D Inorganic Materials Beyond Graphene by C. N. R. Rao and Umesh V. Waghmare, World Scientific (in publication)

News Media Coverage

- "*Doctoral student at 15*" by Malini Banerjee in The Telegraph: http://www.telegraphindia.com/1090830/jsp/calcutta/story_11427659.jsp

- "*Summa cum laude for 16-yr-old IISc prodigy*" by Sameer Ranjan Bakshi in Bangalore Mirror: http://bangaloremirror.indiatimes.com/bangalore/cover-story/Summa-cum-laude-for-16-yr-old-IISc-prodigy/articleshow/21611112.cms

References

1. **Prof. Arindam Ghosh**
   Associate Professor
   Department of Physics
   Indian Institute of Science
   Bangalore 560012, India

   Email: arindam@physics.iisc.ernet.in
   Phone: +91 80 2293 3288

2. **Dr. Srijit Goswami**
   Senior Scientist
   QuTech
   Lorentzweg 1
   2628 CJ Delft, Netherlands

   Email: sgoswami@gmail.com
   Phone: +31 638503639

3. **Prof. Sir Michael Pepper**
   Pender Professor of Nanoelectronics
   Department of Electronic & Electrical Engineering
   University College London
   London WC1E 7JE, United Kingdom

   Email: michael.pepper@ucl.ac.uk, mp10000@cam.ac.uk
   Phone: +44 20 7679 3978

4. **Prof. Rajdeep Sensarma**
   Professor
   Department of Theoretical Physics
   Tata Institute of Fundamental Research
   Dr. Homi Bhabha Road
   Colaba, Mumbai 400005, India

   E-mail: sensarma@theory.tifr.res.in
   Phone: +91 22 2278 2431