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Academic Record

- Research Associate (June 2012 onwards): **Chemistry**, University of Rochester, New York.
- PhD, Physics (2012): **University of Rochester**, Rochester, New York.
- Master's, Physics (2009): **University of Rochester**, Rochester, New York.
- Master of Science, Physics (2006): **S.N. Bose Centre for Basic Sciences**, Kolkata, India.
- Bachelor of Science, Physics (2004): **University of Lucknow**, Lucknow, India.

Research Interests

Light Extraction in Organic Light Emitting Diode (OLED), Light Scattering by Nano Particles, Electronic Structure of Metal Oxides; Contacts of OPV and OLED; CdS/CdTe Solar Cell; Band Dispersion and Electronic Structure of Single Crystals; and Semiconductor Physics.

Research Techniques/Skills

- Finite Domain Time Difference (**FDTD**, **Lumerical**) Simulations.
- Scattering and Absorption of Light by Metal Nano Particles.
- Operation and Maintenance of Ultra High Vacuum (**UHV**) Systems.
- Thermal Evaporation, Doping, Spin Casting, and Data Acquisition.
- X-Ray and Ultra-Violet Photoemission Spectroscopy (**XPS** and **UPS**).
- Inverse Photoemission Spectroscopy (**IPES**).
- Scanning Tunneling Microscopy (**STM**) and Atomic Force Microscopy (**AFM**).

Award / Fellowships

- **Iris Ovshinsky**, Graduate Student Award, American Physical Society (APS) in March 2011.
- **Junior Research Fellowship**, SNBNCBS India, for pursuing PhD, August 2006 to July 2007.
- **PBIR fellowship**, SNBNCBS India, for MSc Physics, from Aug 2004 to July 2006.

List of Publications

1. **Irfan Irfan**, A. J. Turinske, Z. Bao, and Y. Gao, "Work function recovery of air exposed molybdenum oxide thin films", *Appl. Phys. Letts.* **101**, 093305 (2012).
2. Sondra Hellstrom, M. Vosgueritchian, R. Stoltenberg, **Irfan Irfan**, M. Hammock, B. Wang, C. Jia, X. Guo, Y. Gao, and Z. Bao, "Strong and stable doping of carbon nanotubes and graphene for high-performance transparent electrodes", *Nano Letters* **12**, 3574 (2012).
3. **Irfan Irfan**, and Y. Gao, "Effect of Air Annealing on MoO_x Thin Films", *J. Phot. Ener.* **2**, 021213 (2012).
4. **Irfan Irfan**, S. Graber, and Y. Gao, "Interplay of cleaning and de-doping in oxygen plasma treated high work function indium tin oxide", *Org. Elec.* **13**, 2028 (2012).
5. **Irfan Irfan**, H. Lin, W. Xia, H. S. Wu, C. W. Tang, and Y. Gao, "Effect of MoO_x inter-layer on thin film CdTe/CdS solar cell", *Sol. Ener. Mater. Sol. Cell* **105**, 86 (2012).
6. H. Lin, **Irfan**, W. Xia, H. S. Wu, Y. Gao, and C. W. Tang, "MoO_x back contact for CdS/CdTe thin film solar cells: preparation, device characteristics, and stability", *Sol. Ener. Mater. Sol. Cell* **99**, 349 (2012).
7. J. Subbiah, C. M. Amb, **Irfan Irfan**, Y. Gao, J. Reynolds, and F. So, "High Efficiency Inverted Polymer Solar Cells Using Metal Oxide Inter-layers", *ACS App. Mater. Inter.* **4** (2), 866 (2012).
8. **Irfan**, W. Xia, H. Lin, H. Ding, C. W. Tang, and Y. Gao, "Nitric-phosphoric acid etching effects on the surface chemical composition of CdTe thin film", *Thin Solid Films* **520**, 1988 (2012).
9. **Irfan**, F. So, and Y. Gao, "Photoemission Spectroscopy Characterization of Attempts to Deposit MoO₂ Thin Film", *Int. J. Photoenergy* **2011**, 314702 (2011) (Invited).
10. **Irfan**, M. Zhang, H. Ding, Y. Gao, and C. W. Tang, "Strong inversion and band bending in C₆₀", *Organic Electronics*, **12**, 1588 (2011).
11. M. Zhang, **Irfan**, H. Ding, Y. Gao, and C. W. Tang, "Organic Schottky barrier photovoltaic cells based on MoO_x/C₆₀", *Appl. Phys. Letts* **96**, 183301(2010).
12. **Irfan**, H. Ding, Y. Gao, D. Y. Kim, J. Subbiah, C. Small, and So, F., "Energy level evolution of air and oxygen exposed MoO₃ films", *Appl. Phys. Letts.* **96**, 243307(2010).
13. **Irfan**, H. Ding, Y. Gao, D. Kim, J. Subbiah, and F. So, "Energy level evolution of MoO₃ interlayer between ITO and organic semiconductor", *Appl. Phys. Lett.*, **96**, 073304, (2010).
14. D. Y. Kim, J. Subbiah, G. Sarasqueta, F. So, H. Ding, **Irfan**, and Y. Gao, "The effect of MoO_x interlayer on organic photovoltaic cell", *Appl. Phys. Lett.* **95**, 995, (2009).

Contributed Book Chapter (Under preparation)

The chapter “Contacts and Interfaces in OPV” in the Book “Progress in High Efficiency Solution Processable Organic Photovoltaic Devices- Fundamentals, Materials, Devices and Manufacturing”, editor Prof. Yang Yang at UCLA, by **Springer**.

Mentoring

Name/Affiliation	Project	Outcome
Sachiko Graber, REU 2010 Grinnell College, Iowa	Interplay of cleaning and de-doping in oxygen plasma treated high work function ITO	Organic Electronics 2012.
A. J. Turniske, REU 2011 Uni. Of Wisc. At Oshkosh	Work function recovery of air exposed MoO _x thin films.	Appl. Phys. Letts. 2012.

Presentations/Talks

- **Irfan**, A. J. Turinske, C. W. Tang, F. So, Z. Bao, and Y. Gao, **Invited talk**, “Methods to Protect and Recover the Work Function of Air Exposed MoO_x film”, **SPIE 2012 Meeting** in San Diego, CA.
- **Irfan**, A. J. Turinske, Z. Bao, and Y. Gao, **Oral** presentation, “Workfunction recovery of air exposed MoO_x thin film”, **APS March 2012 Meeting** in Boston, MA.
- **Irfan**, S. Graber, F. So, and Y. Gao, Poster presentation, “The Effect of High Work Function ITO on Organic Semiconductor/ ITO Interface”, **MRS Fall 2011 Meeting** in Boston, MA.
- **Irfan**, H. Ding, and Y. Gao, **Oral** Presentation, “Angle Resolved photo-emission study of Rubrene Single Crystal, Interface Alignment and Growth Dynamics”, **219th ECS Trans. Meeting**, in Montreal, Canada 2011.
- **Irfan**, M. Zhang H. Ding, C. W. Tang, and Y. Gao, **Oral** presentation, “Strong Interface p-doping and Band Bending in C₆₀”, **APS March 2011 Meeting** in Dallas, TX.
- **Irfan**, H. Ding, D. Y. Kim, J. Subbiah, G. Sarasqueta, F. So, and Y. Gao, **Oral** presentation, “Electronic Structure of MoO₃ Insertion Layer at the Interface Between Organic Semiconductor and ITO”, **2009 APS March meeting** in Pittsburgh, PA.

References

Please contact me if you need references.