

# AHMED ESAM MANSOUR

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## PROFILE

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Experienced researcher in the synthesis and characterization of carbon-related materials. Design and troubleshooting of CVD systems, optimization of graphene growth, and its chemical modification towards application as transparent conductive electrode. Advanced user of ultrahigh vacuum systems including installation, maintenance and running experiments. Remarkable leadership practice developed through heading of numerous projects and extracurricular activities.

## EDUCATION

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| <b>2011 – Aug 2016<br/>(Expected)</b> | <b>King Abdullah University of Science and Technology “KAUST”</b><br>PhD. in Materials Science and Engineering - GPA: 3.75/4<br>Thesis Title: Transparent Conducting Electrodes Based on Doped Graphene for Photovoltaic Applications<br>Academic Advisor: Prof. Aram Amassian             | <b>Thuwal - KSA</b>   |
| <b>2009 - Aug 2011</b>                | <b>King Abdullah University of Science and Technology “KAUST”</b><br>MS. in Materials Science and Engineering - GPA: 3.55/4<br>Thesis Title: Structural analysis of planar $sp^3$ and $sp^2$ films: Diamond- like carbon and graphene over layers<br>Academic Advisor: Prof. Aram Amassian | <b>Thuwal - KSA</b>   |
| <b>2004 – Feb 2009</b>                | <b>The University of Jordan “JU”</b><br>BS. in Civil Engineering - GPA : 3.83/4<br>Concentration: Structural Engineering   | <b>Amman – Jordan</b> |

- Additional Courses:**
- The Leadership Challenge® workshop, Wiley, Mr. Graham Moore (master facilitator), two full days, Thuwal – KSA, 2016
  - Technology Entrepreneurship, KAUST Winter Enrichment Program (WEP), Prof. Robert Hisrich, two full weeks, Thuwal – KSA, 2009
  - Economic Feasibility Study, Talal Abu-Ghazaleh Knowledge Village, Dr. Tareq Rasheed, two full days, Amman – Jordan, 2009
  - Introduction to Marketing, Faculty of Business and Administration, JU, Jordan, 2008

- Research interest:**
- Development of low-cost, sustainable and flexible materials for high performance transparent conductive electrodes and devices
  - Synthesis of graphene and carbon-based materials and comprehensive characterization of their structural, electronic, morphological and electrical transport properties
  - Modulation of the electronic, optical and transport properties of materials via doping with molecular and atomic species
  - Working with ultrahigh vacuum systems and related deposition and characterization techniques with special interest in photoelectron spectroscopy (XPS and UPS)

## PROFESSIONAL EXPERIENCE

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- 2013 – May 2014**    **Boeing Research and Technology**    **Thuwal - KSA**  
**King Abdullah University of Science and Technology “KAUST”**  
Research Advisor: Prof. Aram Amassian / Dr. Minas Tanielian  
Enhanced the electrical conductivity of graphite by intercalation, to exceed that of copper towards application in lightweight composite conductors
- Preparation of graphite intercalation compounds (GIC)
  - Performing structural, morphological and chemical characterization
  - Running electrical transport measurements
  - Demonstrate increased conductivity and decreased density of GIC (1<sup>st</sup> milestone) towards the next stage of composites fabrication
- April - May 2012**    **Imperial College London**    **London - UK**  
Research Advisor: Prof. Norbert Klein / Dr. Cecilia Mattevi  
Optimized graphene growth via various routes
- Systematic optimization of chemical vapor deposition (CVD) of single layer graphene on copper and subsequent transfer using PMMA
  - Synthesizing chemically exfoliated graphene oxide solution using the Hummers method
  - Characterization of graphene quality via Raman spectroscopy and SEM
- 2010 – June 2011**    **King Abdullah University of Science and Technology “KAUST”**    **Thuwal - KSA**  
Directed research supervised by Prof. Aram Amassian  
Determined the optimum conditions for the synthesis of ultra-thin diamond-like carbon using FCVA technique towards application as a protective overcoat for magnetic recording thin film hard-drives (collaboration between KAUST and UCB)
- Performing structural and morphological characterization of the carbon overcoat using Raman Spectroscopy and AFM
  - Calculation of the  $sp^3/sp^2$  hybridization content ratio by analysis of XPS spectra
- Aug – Sept 2010**    **University of California, Berkeley (UCB)**    **California - USA**  
**June – Aug 2009**    Research Advisor: Prof. Paulo Montiero  
Achieved 80% pozzolan based geopolymers with strength of 70 MPa, using novel Saudi natural pozzolan towards sustainable construction materials  
Preparing samples and testing for strength and workability
- Preparing samples and testing for strength and workability
  - Structural characterization of fresh and hardened paste via XRD and using Berkeley Lab Advance Light Source (ALS)
- June – Sept 2008**    **Center of Excellence for Airport Technology (CEAT)**    **Illinois – USA**  
**University of Illinois at Urbana – Champaign (UIUC)**  
Research Advisor: Prof. David Lange  
Measured Self-Consolidated Concrete’s (SCC) formwork pressure as a function of height and time, towards modeling of large-scale casting
- Preparation of SCC and casting into specially prepared mold
  - Optimize the placement of pressure sensors on the mold

## PUBLICATIONS

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**A. E. Mansour**, S. Dey, M. H. Tanielian and A. Amassian, "Bromination of Graphene: A new route to Making High Performance Transparent Conducting Electrodes with Low Optical Losses", *ACS Appl. Mater. Interfaces*, **2015**, 7 (32), pp 17691 – 17699

**A. E. Mansour**, M. M. Said, S. Dey, H. Hu, S. Zhang, R. Munir, Y. Zhang, K. Moudgil, S. Barlow, S. Marder and A. Amassian, "Facile doping and work-function modification of few-layer graphene using molecular oxidants and reductants ", *Adv. Funct. Mater.*, **2016**. (Submitted)

**A. E. Mansour**, H. Khan, M. N. Hedhili, H. Kim, C. Mattevi and A. Amassian, "Structural and chemical evolution of O<sub>2</sub> plasma-treated Graphene", **2016**. (in preparation)

L. K. Jagadamma, H. Hu, T. Kim, G. O. Ngongang Ndjawa, **A. E. Mansour**, J. C. D. Faria, K. Mahmood, K. Zhao, D. H. Anjum, M. A. McLachlan and A. Amassian, "Solution-Processable MoO<sub>x</sub> Nanocrystals Enable Highly Efficient Reflective and Semitransparent Polymer Solar Cells" *Nano Energy*. **2016**. (Submitted)

H. Hu, Y. Zhong, M. Abdsamie, **A. E. Mansour**, R. Munir, B. Yan, T. Kim, R. Li, D. Smilgies, W. Ni, M. N. Hedhili, N. Stingelin, A. Amassian "High-speed wire-bar coating: ambient fabrication of high performance organic solar cells with PCE up to 10.2% compatible with large area process", *Adv. Mater.* **2016**. (In submission)

## CONFERENCE PRESENTATIONS

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**A. E. Mansour**, M. Said, S. Dey, S. Zhang, H. Hu, R. Munir, Y. Zhang, K. Moudgil, S. Barlow, S. Marder, A. Amassian, "Molecular Electronic Doping of Transparent Conductive Few Layers Graphene Films via Metal-Organic Complexes". **MRS Spring meeting (2016)**, Symposium EE1, Phoenix, USA. (*oral presentation*)

**A. E. Mansour**; S. Dey; M. Tanielian; A. Amassian, "Bromination of Few Layers Graphene: A New Route to Making High Performance Transparent Conducting Electrodes with Low Optical Losses ". **MRS Fall meeting (2015)**, Symposium NN15, Boston, USA. (*poster presentation*)

**A. E. Mansour**; S. Dey; M. Tanielian; A. Amassian, "Bromination of Few Layers Graphene: A New Route to Making High Performance Transparent Conducting Electrodes with Low Optical Losses " **Solar Future 2015**, Thuwal, Saudi Arabia. (*poster presentation*)

**A. E. Mansour**, M. H. Tanielian and A. Amassian, "Bromination of Graphene: A New Route to Making High Performance Transparent Conducting Electrodes with Low Optical Losses". **SPIE NanoScience + Engineering (2015)**, San Diego, USA, Paper number 9552-9. (*oral presentation*)

**A. E. Mansour** (Representing the KAUST MRS student chapter) "Sustainability Forum: Practical Aspects of Interdisciplinary". **MRS Fall meeting (2012)**, Symposium G, Boston, USA. (*online oral presentation*)

**A. E. Mansour**, H. Khan, N. Wang, M. N. Hedhili, Al Ahmari, L. Abdulhalim, K. Komvopoulos, A. Amassian, "Fabrication and Characterization of Ultra-Thin Carbon Overcoats on Magnetic Storage Media". **Conference on Innovative Materials and Applications (CIMA 2011)**, Beirut, Lebanon. (*poster presentation*)

## AWARDS AND RECOGNITIONS

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- KAUST Graduate Fellowship (2009)
- KAUST Discovery Scholarship (2008-2009)
- First of Class honor – Civil Engineering department at the University of Jordan (2009)

## LEADERSHIP AND ACTIVITIES

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- Leadership Practices Inventory: LPI® 360 score of 51/60 (2016)
- Team leader for the students activities working group of MRS university chapters subcommittee (2015-2016)
- Vice President of the MRS student chapter at KAUST (2013-2014)
- Founding officer of the first international MRS student chapter at KAUST, acting as treasurer (2012-2013)
- Leading member of the students liaison team of the CE department at the University of Jordan (2007-2009)
- Founder and webmaster of www.ahm531.com, online web services for civil engineering students (2007)

## PROFFESIONAL ASSOCIATIONS

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- MRS: Materials Research Society – Student membership
- SPIE: The International Society for Optics and Photonics – Student membership
- JEA: Jordanian Engineering Association

## TECHNICAL AND COMPUTER SKILLS

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Computer Skills MS office suite (advanced Excel and PowerPoint), HTML/CSS, MS Visio, Mac OS, AutoCAD.

Scientific Instruments

- Photoelectron spectroscopy (XPS, UPS, PESA)
- Vibrational spectroscopy (Raman, FTIR)
- Microscopy (AFM, SEM, Kelvin probe)
- Electrical transport measurement (4-point probe, Hall effect measurement)
- Design, installation and troubleshooting of high vacuum and ultrahigh vacuum systems

## LANGUAGES

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- Arabic (native)
- English (excellent command / highly proficient in spoken and written English)

## REFERENCES

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**Prof. Aram Amassian**  
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Science and Engineering  
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