MAINAK MAJUMDER

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EMPLOYMENT HISTORY:

January 2012	Senior Lecturer, Mechanical and Aerospace Engineering **Monash University**, Clayton, VIC, Australia
March 2010 – Dec. 2011	Lecturer, Mechanical and Aerospace Engineering **Monash University**, Clayton, VIC, Australia
Aug. 2008 – Jan. 2010	Post-Doctoral Research Associate Mechanical Engineering and Materials Science Richard Smalley Institute for Nanoscale Science and Technology **Rice University**, Houston, TX, USA
Oct. 2007 - Jan. 2010	Post-Doctoral Research Associate Chemical and Biomolecular Engineering Richard Smalley Institute for Nanoscale Science and Technology **Rice University**, Houston, TX, USA
Aug. 2003 - Sept. 2007	Graduate Research Assistant Department of Chemical and Materials Engineering, **University of Kentucky**, Lexington, KY, USA
Feb. 2001 - Aug. 2003	Staff Scientist **Central Glass and Ceramic Research Institute** (CGCRI)*; www.cgcri.res.in, Kolkata, India.

***CGCRI** is a National lab. of India within the Council of Scientific and Industrial Research (CSIR). CSIR labs are similar to the Max-Planck Institutes in Germany or Oak Ridge National Laboratory in the USA.

EDUCATION AND TRAINING:

2008 Postdoctoral Research Associate — ***Rice University***
Chemical and Biomolecular Engineering
Mechanical Engineering and Materials Science

Post-Doc Mentor(s): Professor Matteo Pasquali
Professor Pulickel M. Ajayan

2007 Ph.D. Materials Science and Engineering,
minor in Chemical Engineering — ***University of Kentucky***

- Thesis Title: Molecular Transport Properties Through Carbon Nanotube (CNT) Membrane
  Funding: NSF, Advance Carbon Nanotechnology Program (Air Force) and NIH

Advisor: Professor Bruce J. Hinds

2001 MS, Ceramic Engineering ***Institute of Technology-Banaras Hindu University***

- Thesis Title: Synthesis and Characterization of Dense Cordierite Ceramics by a Semi-chemical Route for Electronic Packaging Application

Advisor: Professor Devendra Kumar

1999 BS, Ceramic Engineering (first class with honors) ***Calcutta University***

Project:
- Incorporation of Nanoscale Materials by Sol-gel Technique in Castable Refractories

GRANTS RECEIVED:

Majumder, Monash University Start-up Grant, 2010, $130,000

Majumder, "NANODOCKS - Liquid Phase Engineered Graphene-Oxide/Graphene Nanomaterials for Environmental Applications" New Staff Members Research Fund, Monash University, 2010-11, $20,000

Majumder, "Fish-Gill' Inspired Microvascular Fluidic Scaffolds", Monash University Engineering Small Grants,2011-12, $30,000

Majumder, Corry, and Schaefer "Carbon Nanotube Fluidic Channels for Desalination – Interplay of Nanoscale Confinement and Electrostatics" ARC Discovery, 2011-14, $435,000

Majumder, Jagadeeshan, Singh, Pasquali, and Ajayan "Nanotechnology Enabled Electrochemical Energy Storage Materials from Indigenous Natural Graphite", ARC Linkage, 2011-13, $300,000

Majumder, Collier Trust Grant, 2011, $3000

Majumder, "Controlled Growth of Aligned Carbon Nanotubes for Nanofluidic Applications" New Staff Members Research Fund, Monash University, 2010-11, $12,500

Majumder, "Towards Wearable Energy Storage Technology From Graphene-Coated Fibers" Monash University Engineering Seed Grant, 2012-13, $30,000

Majumder, "Monash Researcher Accelerator Program", Monash University, 2013-14, $85,000

ADMINISTRATIVE POSITIONS:

Early Career Researcher Network Committee, Monash University, 2010-

Deputy Director of Research and Training, Mechanical and Aerospace Engineering, Monash University, 2011-

TEACHING:

MEC 4425: Micro/Nano Solid and Fluid Mechanics (co-taught with Dr. Tuncay Alan)

MEC 3454: Thermodynamics and Heat Transfer

SELECTED HONORS AND AWARDS:

- **Monash Researcher Accelerator Program (MRAP)** – cohort of 2012 identifying and supporting top 3% of early to mid career researchers at Monash University

- **Best (1st runner-up) paper award** at the Indian Institute of Chemical Engineers, 2007.Kolkata, India

- **North American Membrane Society (NAMS) Travel Award**, 2007, Orlando, FL.
  The NAMS Travel Awards is presented annually to outstanding individuals who are near the start of their professional careers in membrane science and technology. It is competitive with young faculty, post-docs and senior graduate students.

- **Oral Presentation Award** at Eastern Regional Chemical and Materials Engineering Graduate Student Symposium, 2006, Lexington, KY

- **Dissertation Year Fellowship Award** ($16,000)**,** University of Kentucky, 2006, Lexington, KY,
  This fellowship is competitively awarded to four-five people in all disciplines across the University each year.

- **Student Travel Award**, *Gordon Research Conference* in Membranes and Materials, 2006, Colby-Sawyer College, NH

- **NSF/ONR-Sponsored Student Travel Award**, Annual Meeting of the *North American Membrane Society,* 2005, Providence, RI

- **Poster Presentation Award,** KY-Nanomat, 2004, Lexington, KY

- **Banaras Hindu University Gold Medal,** 2001, Varanasi, UP, India

PUBLISHED PAPERS AND DOCUMENTS:

1. **M. Majumder,** P.Sheath, T. Harvey, J.Mardel, A.Thornton,A. Gonzago, D. Kennedy, I. Madsen, J. Taylor, D. Turner, M. Hill, "Aqueous Molecular Sieving and Strong Gas Adsorption in Highly Porous MOFs with a Facile Synthesis", ***Chem.Mater.***, 2012 (accepted)

2. D. E. Lobo, J.Fu, T.Gengenbach, **M. Majumder***, "Localized Deoxygenation and Direct Patterning of Graphene Oxide by Focused Ion Beams" ***Langmuir,*** 2012, 28, 41,14815–14821

3. **M. Majumder**, C.S. Rendall, J. A. Eukel, J. Y.L Wang, N. Behabtu, C. Pint, T.Y. Liu, A. W Orbaek, F. Mirri, J.Nam, A. R Barron, R.H. Hauge, H. K. Schmidt, and M. Pasquali, "Overcoming the 'Coffee-Stain Effect by Compositional Marangoni Flow Assisted Drop-Drying", ***J. Phys. Chem.B*****,** 2012, 116, 22, 6536–6542

4. R.K. Singh Raman, P. Chakraborty Banerjee, Derrek E. Lobo, H.Gullapalli, M.Sumandasa, A.Kumar, L. Choudhary, R.Tkacz, P.M. Ajayan, **M.Majumder*** "Protecting Copper from Electrochemical Degradation by Graphene Coating " ***Carbon***, 2012, 50, 11, 4040–4045

5. J.Wu, K.Gerstandt, **M.Majumder**, B.J. Hinds "Highly Efficient Electro-osmotic Flow through Functionalized Carbon Nanotube Membrane", ***RSC Nanoscale****,* 2011,3, 3321-3328

6. W.Gao, **M. Majumder***, L. Alemany, T. Narayanan, M. Ibarra, B.K. Pradhan, P.M. Ajayan "Engineered Graphite Oxide Materials for Application in Water Purification" ***ACS Applied Materials and Interfaces*****,** 2011,3,6,1821–1826

7. **M.Majumder*** and B.Corry*, "Anomalous Decline of Water Transport in Covalently Modified Carbon Nanotube Membranes", ***Chem. Commun***, 2011, 47, 7683-85

8. **M. Majumder**, N.Chopra, B.J. Hinds***, "****Mass Trans*port through Carbon Nanotube Membranes in Three Different Regimes: Ionic Diffusion and Gas and Liquid Flow" ***ACS Nano,*** 2011, 5, 3867-78

9. M.J. Green, C.C. Young, A.N.G. Parra-Vasquez, **M.Majumder**, V.Juloori, N. Behabtu, C. L. Pint, J. Schmidt, E.Kesselman, R.H. Hauge, Y.Cohen, Y.Talmon and M.Pasquali "Direct imaging of carbon nanotubes spontaneously filled with solvent", ***Chem.Commun.,*** 2011, 47,4,1228 – 1230

10. **M. Majumder,** C. Rendall, M. Li, A. Eukel, H.K. Schmidt, M. Pasquali, "Insight into the physics of spray-coating of SWNT films" ***Chem. Eng. Sci.***, 2010, 65, 6,2000-08

11. **M. Majumder,** A. Stinchcomb, B.J. Hinds, "Towards Mimicking Natural Protein Channels with Aligned Carbon Nanotube Membranes for Active Drug Delivery" ***Life Science****s,* 2010, 86, 15-16, 2010, 563-68

12. **M. Majumder**, "Molecular Transport Properties through Carbon Nanotube Membrane", PhD dissertation, University of Kentucky, 2007. The weblink is: https://archive.uky.edu/bitstream/10225/718/full_dissertation_Dec06.pdf

13. **M. Majumder**, K. Keis, J. Cole, C. Meadows, X. Zhan, B.J. Hinds, "Enhanced Electrostatic Modulation of Transport Through CNT Membrane by Diazonium Grafting Chemistry" ***J. Memb. Sci.***, 2008, 316, 1-2, 89-96.

14.**M. Majumder**, X. Zhan, R. Andrews, B.J. Hinds "Voltage Gated Carbon Nanotube Membranes", ***Langmuir*****,** 2007, 23, 8624-8631.

- This work has been featured in National Institute of Drug Abuse (NIDA) Director's report to the National Advisory Council on Drug Abuse, 2007. Read it at: http://www.nida.nih.gov/DirReports/DirRep907/DirectorReport2.html. This work has initiated a NIH-sponsored research on programmable transdermal drug delivery in collaboration with the Department of Pharmaceutical Sciences, University of Kentucky.

15. **M. Majumder**, N. Chopra, R. Andrews, B.J. Hinds, "Nanoscale Hydrodynamics: Enhanced Flow in Carbon Nanotubes", ***Nature***, 2005, 438, 3, 44.

- This is my single most important work. This break-through discovery on the remarkable water transport behavior through CNTs has been featured in the **press release of NSF's** *Slippery When Wet*, Nov.10, 2005.
- It has also attracted attention in the Royal Chemical Society News, Materials Research Bulletin, Small Times, NASA Tech Briefs etc. This unusual transport behavior has been reproduced by independent researchers at Lawrence Livermore National Laboratory, Livermore, CA. (Holt et al. ***Science*** 312 (2006) 1034-1037). More importantly, this discovery has lead to a US funding initiative from DARPA on CNT membranes for desalination of sea-water.

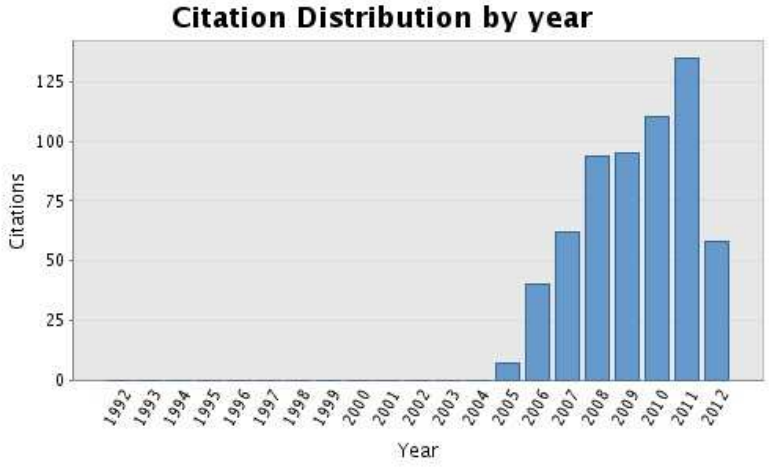
16. **M. Majumder**, N. Chopra, B.J. Hinds, "Effect of Tip Functionalization on Transport through Vertically Oriented Carbon Nanotube Membranes", ***J. Amer. Chem. Soc.,*** 2005,127, 9062-70.

17. N. Chopra, **M. Majumder**, B.J. Hinds, "Bi-functional Carbon Nanotubes by Sidewall Protection", ***Adv. Funct .Mat.,*** *2005,* 15,858-64.

18. **M. Majumder**, S. Mukhopadhyay, O.Parkash, D.Kumar, "Sintering and Crystallization Behavior of Chemically Prepared Cordierite for Application in Electronic Packaging", ***Ceram. Inter.*****,** 2004, 30, 1067-1070.

19. S. Mukhopadhyay, S. Dutta, **M. Majumder**, A. Kundu and S.K. Das, "Synthesis and Characterization of Alumina Bearing Sol for Application in Refractory Castables", ***Industrial Ceramics*****,** 2000, 20, 2, 88-92.

See citation metrics below: Total # of cites: 602; Citations per article: 40.13



BOOK CHAPTER:

20. **M. Majumder*** and P.M. Ajayan, "Carbon Nanotube Membranes: A new frontier in membrane science" in: Enrico Drioli and Lidietta Giorno Comprehensive Membrane Science and Engineering (Elsevier Science), 2010, 1, 291–310

21. Abozar Akbari, **M. Majumder**, and Mahsa Tehrani, "Polylactic acid (PLA) Carbon Nanotube Nanocomposites" in: K.K. Kar, S.Rana, J.K. Pandey, Technological advancement in the carbon nanotube (CNT) based polymer composites: Processing, performance and application (Springer), 2012 (accepted for publication).

22. Mahsa A.Tehrani, Abozar Akbari**,** and **M. Majumder** in: K.K. Kar, S.Rana, J.K. Pandey, "Polylactic acid (PLA) Layered Silicate" in: K.K. Kar, S.Rana, J.K. Pandey, Technological advancement in the carbon nanotube (CNT) based polymer composites: Processing, performance and application (Springer), 2012 (accepted for publication).

23. Ehsan Zeimaran, Abozar Akbari, **M. Majumder "**Polystyrene Carbon Nanotube Nanocomposites" in: in**:** K.K. Kar, S.Rana, J.K. Pandey, Technological advancement in the carbon nanotube (CNT) based polymer composites: Processing, performance and application (Springer), 2012 (accepted for publication).

PUBLISHED CONFERENCE PROCEEDINGS:

24. A. Tiwari, P.Chakraborty-Banerjee, R.K.S Raman, **M.Majumder**, "CVD Graphene for Remarkable Resistance to Corrosion Resistance", Australian Corrosion Association, November 2012, Melbourne, Australia

25. S. J. Chen, W. H. Duan, F. Collins & X. L. Zhao, **M. Majumder,** "Effects of geometry packing upon the aggregation morphology of sodium cholate on the surface of carbon nanotubes" ACUN6 –Composites and Nanocomposites in Civil, Offshore and Mining Infrastructure, November 2012, Melbourne, Australia

26. **M.Majumder,** Pasquali, 2012, "Harnessing Compositional Marangoni Flow in Depositing Nanoparticle Films", Proceedings of the Annual Meeting of the American Physical Society, Division of Fluid Dynamics, November 2012, San Diego, CA.

27. P. Sheath, **M. Majumder**, 2011, A comparative review of graphene oxide and titanium dioxide as photocatalysts, *Chemeca 2011 Engineering a Better World*, 18 to 21 September, **2011**, Engineers Australia, Canberra Australia, 1-10.

28. **M. Majumder**, N. Chopra, B.J. Hinds, "Gated Chemical Transport and Enhanced Flow Through Carbon Nanotube Membranes" **2006,** *Nanotech*,1, 106-09

29. S. Bandyopadhyay, **M.Majumder**, H.S. Maiti, "Field Trial Studies for Arsenic Removal from Highly Contaminated Ground Water using Ceramic Membrane Modules", *Proceedings of National Seminar on Desalination and Membrane Technology:* Present and Future, 2003,Bhavnagar, India.

30. **M.Majumder** and B.J. Hinds "Mass Transport Through Carbon Nanotube Membrane", Special session on Nanotechnology at the *Annual Meeting of Indian Institute of Chemical Engineers*, 2007, Kolkata, India.; ***Won best paper (2nd place) award***

INVITED TALKS:

1. **M.Majumder,** "Unusual Molecular Transport Properties of Carbon Nanotubes", Annual Meeting of the Australian Institute of Physics, 2012, December 9-13th, Sydney, Australia.

2. **M.Majumder,** "Expanding the Application Space of Expanding the Application Space of Graphene-Based Materials", Texas Tech University, Department of Chemical Engineering Seminar, 9th November, 2012, Lubbock, TX, USA.

3. M.Majumder, "Expanding the Application Space of Graphene-Based Materials", NT-12, Brisbane, June 24-29th, 2012

4. **M.Majumder**, "Engineering with Nanocarbons", Victoria University, Institute of Sustainability and Innovation, Victoria University, 17th March, 2012, Melbourne, Australia,

5. **M.Majumder,** "Supersand: Creating Water Security Through Nanomaterials" 14th December, 2011, Society for International Development, Ottawa, Canada (video lecture)

6. **M.Majumder**, "Engineering with Nanocarbons, PACRIM-9, Cairns, Australia, 10th-14th July, 2011

7. M.Majumder, "Fluid Flow Through Carbon Nanotubes: Prospects and Challenges", 4th November, 2010, CSIRO Materials Science and Engineering, Belmont, Geelong.

8. M. Majumder, "Fluid Flow Through Carbon Nanotubes: Prospects and Challenges", 7th October, 2010, Swinburne University, Melbourne

9. **M.Majumder,** "Environmental Nanotechnologies", Oct.1, 2009, Conoco-Philips R&D Center, Bartlesville, OK

10. **M.Majumder** "Mass Transport Through CNT Membranes: Enhanced Flow and Voltage-Gating Effects", April 6, 2007, Carbon Nanotechnology Laboratory, Rice University, TX.

11. **M. Majumder** and B J Hinds, "Nano-Scale Transport Phenomena in the Ionic, Solvent and Gaseous Regimes through Carbon Nanotube Membranes", presented at the *Annual Meeting of AIChE,* 2006, San Francisco, CA.

12**. M.Majumder,** "Synthesis and Applications of Carbon Nanotube Membranes", Central Glass and Ceramic Research Institute, 2006, Kolkata, India.

PATENTS AND INVENTION DISCLOSURES:

1. **M. Majumder**, D.E. Lobo, J. Fu, "Conductive Portions in Insulating Materials", Australian provisional patent 2012902606, 21st July 2012

2. **M.Majumder**, W.Gao, P.M. Ajayan, T.N. Narayanan, B.K. Pradhan, "Graphite-oxide coated particulate material and uses thereof", WO 2012128747, 9th September 2012

3. A.W.K. Ma, N.Behabtu, **M.Majumder,** J.Nam, F.Mirri, M.Pasquali, "Carbon Nanotube Films Processed From Strong Acid Solutions And Methods For Production Thereof", Reference Tech ID 2012-016

CONTRIBUTED PRESENTATIONS:

- **From Monash University**

1. **M.Majumder**, "Fluid Flow Through Carbon Nanotubes: Prospects and Challenges", Chemeca-2010, 26th-29th September, 2010, Adelaide, Australia

2. D.Lobo, C.Pint, B.Corry, **M.Majumder**, "Building Carbon Nanotube Fluidic Devices", Chemeca-2011, 18th-21st September, 2011, Sydney, Australia

3. P.Sheath, Z.Liu, **M.Majumder**, "Graphene Oxide as an Alternative Photocatalyst", Chemeca-2011, 18th-21st September, 2011, Sydney, Australia

4. **M.Majumder**, "Expanding the Application Space of Graphene-based Materials" October 28 - November 2, 2012 AIChE Annual Meeting, Pittsburg, PA

- **From Rice University**

1. C.Rendall, **M.Majumder**, M.Pasquali, "Spreading Water on Teflon: Marangoni Influences and the Elimination of the Ring Stain" Annual Gallery of Fluid Motion exhibit, *Annual meeting of the American Physical Society, Division of Fluid Dynamics,* 2009, Minnesota, MN

2. **M. Majumder**, B.Dan, M.Li, H.K. Schmidt, M. Pasquali, "Dielectrophoresis of colloidal suspensions of SWNTs: Formation of 1-D Assemblies"**,** Annual Meeting of the *American Institute of Chemical Engineers*, 2009, Nashville, TN

3. C.L. Pint, Y. Xu, N. Nicholas, **M. Majumder**, T. Leeuw, and R. H. Hauge "Growth and transfer of aligned single-walled carbon nanotube arrays: new opportunities for electrical and optical characterization and innovative applications" *Tenth International Conference on the Science and Application of Nanotubes*, 2009, Beijing, China

4. **M. Majumder**, C. Rendall, M. Li, B.Dan, H.K. Schmidt, M. Pasquali, "Spray-Coated Transparent Conductive Coatings from SWNTs: Effect of processing parameters", Annual Meeting of the *American Institute of Chemical Engineers*, 2008, Philadelphia, PA.

5. **M. Majumder,** H.K. Schmidt and M. Pasquali, "Nano-channels for Oil Recovery" Concept poster presented at the pre-solicitation workshop of *Advanced Energy Consortium*, 2008, Austin, TX.

6. B. Dan**, M, Majumder**, M. Pasquali, "Continuous and Scalable Fabrication of Transparent Conducting Thin Films of Single Walled Carbon Nanotubes**"**, March Meeting of *the American Physical Society*, New Orleans, 2008, LA.

- **From University of Kentucky**

1. **M. Majumder** J. Wu, K.Gerstandt, and B.J. Hinds, "Aligned Carbon Nanotube Membranes with Enhance Fluid Flow and Active Gate Keeper Selectivity for Water Purification" to be presented at the Fall Meeting of the *Materials Research Society*, 2009, Boston, MA.

2. J. Wu, K.Gerstandt, **M. Majumder** and B.J. Hinds, "Electro-osmotic Flow Through Carbon Nanotube Membranes" to be presented at the Fall Meeting of the *Materials Research Society*, 2009, Boston, MA.

3. **M.Majumder,** K. Keis, and B.J. Hinds, "Electrochemical Double Layer Behavior on Vertically Oriented CNT Membranes", Annual Meeting of the *American Institute of Chemical Engineers,* 2008, Philadelphia, PA.

4. **M. Majumder**, and B.J. Hinds, "Mass transport through CNT membranes in three different regimes: ionic, gas, and liquid", Annual Meeting of the *American Institute of Chemical Engineers,* Philadelphia, 2008, Philadelphia, PA.

5. **M. Majumder**, X. Zhan, X. Su, B.J. Hinds, "Voltage Gated Channels from Aligned Carbon Nanotube Membrane" *Materials Research Society Fall Meeting*, 2007, Boston, MA.

7. **M. Majumder** "Carbon Nanotube membranes: A New Frontier in Membrane Science", *International Conference on Catalysis in Membrane Reactors*, 2007, Kolkata, India.

8. **M.Majumder,** "Transport properties through carbon nanotube membranes", seminar at the Department of Chemical and Materials Engineering, University of Kentucky, 2007, Lexington, KY.

9. **M. Majumder** and B.J. Hinds, "Chemical and Voltage Gated Transport Through Carbon Nanotube Membrane", Annual Meeting of the *North American Membrane Society*, 2007, Orlando, FL.

10. **M. Majumder** and B.J. Hinds, "Nanoscale Transport Phenomena in the Ionic, Solvent and Gaseous Regimes through Carbon Nanotube Membranes", Annual Meeting *of American Institute of Chemical Engineers,* 2006, San Francisco, CA.

11. **M.Majumder** and B.J. Hinds, "Voltage Gated Chemical Transport Through Carbon Nanotube Membranes", Oral presentation at *Eastern Regional Chemical and Materials Engineering Graduate Symposium (ERCGS-2006),* 2006, Lexington, KY.

12. H.K. Vaddi**, M. Majumder**, A.L. Stinchcomb, B.J. Hinds, "Aligned Carbon Nanotube Membranes for Transdermal Nicotine Delivery", *Second International Conference on Bioengineering and Nanotechnology*, 2006, University of California Santa Barbara, CA.

13. C. Meadows, **M. Majumder** and B.J. Hinds, "Electrochemical Modification and Characterization of Multiwalled Carbon Nanotube Membranes", poster presented at *Inter-University NSF-REU student meeting,* 2006, Lexington, KY

14. **M. Majumder** and B.J. Hinds, "Mass Transport Through Vertically Oriented Carbon Nanotube Membranes in Three Different Regimes: Ionic, Liquid and Gas", poster presented at *Gordon Research Conference on Membranes: Materials and Processes*, 2006, Colby Sawyer College, NH.

15. **M. Majumder** and B.J. Hinds, "Selective Chemical Transport Through Carbon Nanotube Membranes", poster presented at *Gordon Research Conference on Membranes: Materials and Processes*, 2006, Colby Sawyer College, NH.

16. B.J. Hinds, **M. Majumder**, N.Chopra, "Gated Chemical Transport Through Vertically Aligned Carbon Nanotube Membranes", Annual Meeting of the *American Institute of Chemical Engineers*,2005,Cincinnati, OH.

17. B.J. Hinds, A. Stinchcomb**, M. Majumder**, N.Chopra, "Controlled Trans-dermal Nicotine Delivery with Aligned Carbon Nanotube Membrane," presented at the Annual Meeting of the *American Institute of Chemical Engineers*,2005, Cincinnati, OH.

18. **M. Majumder,** N.Chopra, B.J. Hinds, "Pressure Driven Transport and Hydrogen Bonded Ordering of Liquids Inside Carbon Nanotubes", presented at the Annual Meeting of the *American Institute of Chemical Engineers*,2005,Cincinnati, OH.

19. **M. Majumder**, N. Chopra and B.J. Hinds, "Ionic and Solvent Transport Through Carbon Nanotube Membranes", Oral Presentation at the *Graduate Chemical Engineering Seminar*, 2005, West Virginia University, WV.

20. **M.Majumder,** N.Chopra, B.J. Hinds, "Ionic Transport Through Aligned Carbon Nanotube Membranes Functionalized at the Core Entrance", Oral presentation at the Annual Meeting of *North American Membrane Society*, 2005, Providence, RI.

21. N. Chopra, **M.Majumder**, B.J. Hinds, "Selective End Functionalization of Carbon Nanotubes by Sidewall Protection in Aligned Membrane Structures", Poster presented at the *Fall Meeting of Materials Research Society*, 2004, Boston, MA.

22. **M. Majumder**, N.Chopra, B.J. Hinds, "Transport Properties through Functionalized Aligned Carbon Nanotube Membranes", Poster presented at the Fall Meeting of *Materials Research Society (MRS)*, 2004, Boston, MA.

23. N.Chopra, **M.Majumder**, B.J. Hinds, "Bi-functional Carbon Nanotube by side wall protection from aligned Carbon Nanotube Membrane", Poster presented at *KY-Nanomat, 2004*, Lexington, KY.

24. **M.Majumder**, N.Chopra, B.J. Hinds, "Transport Studies of Tip-Functionalized Aligned Carbon Nanotube Membranes", Poster presented at *KY-Nanomat, 2004*, Lexington, KY; ***won poster presentation award***

25. H.K. Vaddi, **M.Majumder**, A.L. Stinchcomb, B.J. Hinds "Controlled Transdermal Nicotine Delivery With Octadecyl Amine Carbon-nanotube Polystyrene Membranes", Poster Presented at the Annual Session of the *American Association for Pharmaceutical Scientists (AAPS)*, 2004, Baltimore, MD.

- **From research at Central Glass and Ceramic Research Institute (CGCRI)**

1. S. Bandyopadhyay, **M.Majumder**, T. Dey and H.S. Maiti, "Sustained Field Trial of an Innovative Technology for Environmental Application", Presented at the *Indian Chemical Engineering Congress (CHEMCON),* 2004, Mumbai, India.

2. S. Bandyopadhyay, **M.Majumder**, B.Sinha and H.S. Maiti, "Innovative Process for Arsenic Removal from Groundwater", Presented at the *Indian Chemical Engineering Congress (CHEMCON),* 2004, Mumbai, India.

3. S. Bandyopadhyay, **M. Majumder**, T. Dey, H.S. Maiti "Community Models of Ceramic Membrane Based Arsenic and Iron Removal Plants for Production of Safe Drinking Water", Poster presented at *International Conference on Inorganic Membranes (ICIM-8),* 2004, Cincinnati, OH.

4. S. Bandyopadhyay, **M.Majumder**, H.S. Maiti, "Field Trial Studies Using Ceramic Membrane Modules For Arsenic Removal from Ground Water", Proceedings of the Annual Meeting of the *Indian Chemical Engineering Congress (CHEMCON)*, 2003, Bhuvaneshwar, India.

5. **M.Majumder**, T. Dey, S. Bandyopadhyay, "Flux Restoration in Ceramic Membranes by Physical Methods", Proceedings of the Annual Meeting of the *Indian Chemical Engineering Congress* (*CHEMCON*), 2003, Bhuvaneshwar, India.

6. S. Chattopadhyay, **M. Majumder**, S. Bandyopadhyay, "Optimization of Process Parameters for Preparation of Zirconia based Ultra-filtration Membrane", poster presented at the 66th *Annual Session of the Indian Ceramic Society*, 2002, Calcutta, India.

7. **M.Majumder**, S.N. Roy, S. Bandopadhyay, H.S. Maiti, "Ceramic Membranes for Water Treatment Applications", poster presented at the 66th Annual Session of the *Indian Ceramic Society,* Dec., 2002, Calcutta, India.

8. S. Bandyopadhyay, **M.Majumder**, H.S. Maiti, "Potablisation of Arsenic Contaminated Ground Water Using Ceramic Membranes", Presented at the *International Conference on Inorganic Membranes* (*ICIM-7*), 2002, Dalian, China.

IN MEDIA AND PRESS

1. November 10, 2005 - Slippery when wet (on enhanced water flow through carbon nanotube**)**
http://www.nsf.gov/news/news_summ.jsp?cntn_id=104627

http://en.wikipedia.org/wiki/Potential_applications_of_carbon_nanotubes

http://www.chemeurope.com/en/encyclopedia/Nanotube_membrane.html

http://www.sciencedaily.com/releases/2005/11/051104085644.htm

2. June 24, 2011 - Super-sand for water purification (on graphite-oxide coated sand)
http://www.bbc.co.uk/news/business-13895077

http://portal.acs.org/portal/acs/corg/content?_nfpb=true&_pageLabel=PP_ARTICLEMAIN&node_id=223&content_id=CNBP_027526&use_sec=true&sec_url_var=region1&__uuid=e901d732-d3bd-407e-9705-72e881fa435e

http://www.sciencedaily.com/releases/2011/06/110622102831.htm

http://www.cosmosmagazine.com/news/4504/super-sand-could-improve-water-filtration

http://www.sterlitech.com/blog/2011/07/11/super-sand/

http://www.filtsep.com/view/19207/super-sand-filters-five-times-better/

http://www.theage.com.au/national/education/bridge-over-troubled-waters-20110808-1iiyi.html

3. September 23, 2012- Invisible barrier wards off corrosion (on dramatic anti-corrosion properties of graphene)
http://www.monash.edu.au/news/show/invisible-barrier-wards-off-metal-corrosion

http://www.zdnet.com/graphene-switches-to-new-role-as-anti-corrosion-coating-7000004951/

http://proedgewire.com/graphite-graphene-intel/graphene-a-magic-material-v-corrosion/

http://www.eurekamagazine.co.uk/design-engineering-news/graphene-based-coating-helps-prevent-metal-corrosion/45541/

SUPERVISION AND MENTORING EXPERIENCE:

- **Postdoctoral Researchers**

Dr. Sivakumar Balakrishnan (Nov 2011- till date) (100% supervision)

Dr. Parama Banerjee-Chakraborty (Dec 2011- till date) (60% supervision)

❖ **Post-Graduate Students**

Abishek Tiwari (2012-) PhD candidate, Monash University, (40% supervision)

Prasoon Kumar (2011-) PhD candidate, IITB-Monash Research Academy (50% supervision)

Morteza Miansari (2011 – till date), PhD candidate, Monash University (60% supervision)

Rachel Tkacz (2011- till date), PhD candidate, Monash University (60% Supervision)

Phillip Sheath (2010 – till date), PhD candidate Monash University (100% supervision)

Derrek Lobo (2010- till date), PhD candidate, Monash University (100% supervision)

Wei Gao (Rice Grad, Chemistry, 2009 – 2010): Advised and supervised research on fabrication of carbon nanotube and graphene based membranes for fluid filtration applications.

Budhadipta Dan: (Rice grad, 2008 - 2010): Supervising research on dielectrophoretic assembly of micro-wires from SWNT decants.

Damir Aidarkhanov (Rice grad, 2008 - 2009): Advised research on fabrication of Au-nanowires by electroplating inside membrane templates for rectifying optical antenna applications.

Raghav Wahi (Rice grad, Materials Science, 2008 - 2009): Advised research on super-capacitors and capacitive deionization process.

❖ **Undergraduate and high school students:**

*Qi Ng (*Monash Undergrad, 2011): Synthesis of Carbon Nanotubes Using Chemical Vapor Deposition.

Lim Cheng (Monash Undergrad, 2011): Investigation of photocatalytic and adsorption properties of Copper-Reduced Graphite Oxide Composites.

Amanda Gonzago (Monash Undergrad, 2011): Photocatalytic Properties of Metal Organic Frameworks

Hannah Golding (Monash undergrad, 2010): Hierarchical structures and transport processes in 'fish-gill' systems

Rahoul Pankhania (Monash undergrad, 2010): Microfluidic Architectures

Ivan Loo (*Rice undergrad*, 2009): Advised and supervised his research on self- and directed- assembly of micelle encapsulated SWNT microwires

Michelle Li (Rice undergrad, 2008): Advised and supervised her research on fabrication of transparent thin films and nanowires by dielectrophoretic assembly from CNT suspensions.

Laura Timmerman (Rice undergrad, 2008): Supervised undergraduate research on dielectrophoretic separation of carbon nanotubes.

Clint Rendall (Rice undergrad, 2007-08): Advised and supervised undergraduate research on fabrication of conductive transparent coatings by a spraying process.

Jeggan Cole (Eastern Kentucky University undergrad, 2006): Advised and supervised summer research work on 'Finite Element Modeling of Electrostatic Partitioning of Charged Molecules in Charged Pores using COMSOL'; won a poster presentation award

Corey Meadows (NSF-REU student, 2006): Supervised summer research on electrochemical measurement of functional density of carboxylic acid functional groups on CNT membranes; won a poster presentation award

Mia Williams (High-School Student, 2005): Supervised work on self-assembly chemistry for making alumina membranes hydrophobic and measurement of contact angles and transport properties.

Wendy Satterwhite (*NSF-REU student, Randolph-Macon undergrad*, 2005)*:* Supervised the summer project on electrochemical oxidation studies of carbon nanotubes, synthesis of diazonium compounds for electrochemical grafting on CNTs

Tanmay Dey (Jadavpur University post-grad, CGCRI, 2002-03): Supervised project on design and optimization of membrane based pilot plants for arsenic and iron removal from ground water.

Sudipta Chattopadhyay (Calcutta University post-grad, CGCRI, 2001-02): Advised and supervised the research for development of sol-gel based ceramic membranes at CGCRI.

Asish Tewari (Banaras Hindu University undergrad, 2000): Supervised undergraduate research on sintering of cordierite ceramics at Banaras Hindu University.

PROFESSIONAL ACTIVITIES AND SERVICES:

Reviewer for: *Journal of Membrane Science, Small, Physics of Fluids, Open Journal of Applied Physics, Environmental Science and Technology, Journal of Physical Chemistry, Biomicrofluidics, ACS Nano, ACS Applied Materials and Interfaces, Journal of the American Chemical Society*

Co-Convener: Dr. Stephen Hawkins (CSIRO) and Dr. Mainak Majumder are co-convening the Symposia on Metrology and Methodology at the 13th International Conference on the Science and Application of Nanotubes (NT-12) at Brisbane, June 24-29th, 2012

Co-chair: Dr. Benjamin Wilhite (Texas A&M) and Dr. Mainak Majumder are co-chairing the session on Ceramics for Gas Separations and Membrane Reactors to be held at the Annual Meeting of the American Institute of Chemical Engineers (AIChE meeting at Pittsburg, USA), October 28 - November 2, 2012