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### EDUCATION

Post-Doctoral Research	1993-1994	Rensselaer Polytechnic Institute, USA
Ph.D.	1992	Rensselaer Polytechnic Institute, USA
Master of Technology, Chemical Engineering	1987	Indian Institute of Technology Kanpur
Bachelor of Engineering, Chemical Engineering	1985	Jadavpur University

### RESEARCH HIGHLIGHTS

Broad Area: Interfacial Transport Phenomena

Specific Area: Digital Microfluidics, Microscale Heat Transfer, Electrowetting

Publications: Journals: **120+** (***h index 33***)

Citations: **3400+** (Source : Google Scholar)

Supervision: *Completed*: Ph.D. - 9, *Ongoing*: Ph.D. - 11

Research Grants: DST, DIT, DBT, Intel, ISRO, MHRD & others (Total amount Rs. 7.0 crore approx. from 1995)

### HONORS AND AWARDS

- Fellow of the National Academy of Engineering, India.
- Herdillia Award (2008) by the IChE for Excellence in Basic Research in Chemical Engineering.
- Senior Associate of the International Centre for Theoretical Physics (ICTP), Trieste, Italy.
- Best Paper Award at the 4th ASME/JSME Thermal Engineering Joint Conference, March 1995, Hawaii, USA.
- First in the class, M. Tech at IIT Kanpur.
- University Gold Medalist for academic excellence, Jadavpur University, Calcutta, India.

## PUBLICATIONS

### Journal

- 1) U. Ghosh, M. Chakraborty, A. Bhandari, S. Chakraborty, S. DasGupta Effect of Surface Wettability on Crack Dynamics and Morphology of Colloidal Films, *Langmuir*, 31 (22), 6001-6010, 2015.
- 2) M. Chakraborty, R. Chatterjee, U. Ghosh, S. DasGupta, Electrowetting of Partially Wetting Thin Nanofluid Films, *Langmuir*, 31 (14), 4160-4168, 2015.
- 3) R. Dey, S. DasGupta, and S. Chakraborty, Electrically modulated dynamic spreading of drops on soft surfaces, Accepted for publication in *Applied Physics Letters*, 2015.
- 4) M. Chakraborty, U. Ghosh, S. Chakraborty, S. DasGupta Thermally Enhanced Self-Propelled Droplet Motion on Gradient Surfaces, *RSC Advances*, 5, 45266-45275, 2015.
- 5) S. K Bhaumik, A. Kannan, S. DasGupta, Taylor-Aris Dispersion Induced by Axial Variation in Velocity Profile in Patterned Microchannels, *Chemical Engineering Science*, 134, 251-259, 2015.
- 6) A. Sett, S. Bag, S. Dasgupta and S. DasGupta. Interfacial Force Driven Pattern Formation During Drying of A $\beta$  (25-35) Fibrils, *International Journal of Biological Macromolecules* 79 (2015) 344-352, 2015.
- 7) P. K. Kundu, S. Chakraborty, S. DasGupta, Experimental and Theoretical Evaluation of On-Chip Micro Heat Pipe" *Nanoscale and Microscale Thermophysical Engineering*, 19, 75-93, 2015.
- 8) S. Sen, S. Konar, A. Pathak, S. Dasgupta, S. DasGupta, Effect of Functionalized Magnetic MnFe<sub>2</sub>O<sub>4</sub> Nanoparticles on Fibrillation of Human Serum Albumin, *The Journal of Physical Chemistry B*, 118 (40), pp 11667-11676, 2014.
- 9) N. Pandey, S. Mitra, M.Chakraborty, S.Ghosh, S. Sen, S, Dasgupta and S. DasGupta, Disruption of Human Serum Albumin Fibrils by a Static Electric Field, *J. Phys. D: Appl. Phys.* 47, 305401, 2014.
- 10) M. Chakraborty, A. Ghosh, S. DasGupta, Enhanced Microcooling by Electrically Induced Droplet Oscillation, *RSC Advances*, 4 (3), 1074 - 1082, 2014.
- 11) S. K. Bhaumik, R. Roy, S. Chakraborty and S. DasGupta, Low-Voltage Electrohydrodynamic Micropumping of Emulsions, *Sensors & Actuators: B*. 193, 288-293, 2014.
- 12) S. K. Bhaumik, S. Das, S. Chakraborty and S. DasGupta, Droplet Transport Through Dielectrophoretic Actuation using Line Electrode, *Microfluidics and Nanofluidics*, 16 (3), 597 - 603, 2014.
- 13) S. Bhaumik, S. Chakraborty and S. DasGupta, Electrowetting of Evaporating Extended Meniscus, *Soft Matter*, 8, 11302-11309, 2012.
- 14) R. Dey, S. DasGupta, and S. Chakraborty, Thermally Activated Control of Microfluidic Friction, *Appl. Phys. Lett.*, 101, 134101-5, 2012.
- 15) D. Chakraborty, N. Bose; S. Sasmal, S. Dasgupta, T. K. Maiti, S. Chakraborty and S. DasGupta, "Effect of Dispersion on the Diffusion Zone in Two-phase Laminar Flows in Microchannels", *Analytica Chimica Acta* 710, 88-93, 2012.

- 16) S. Bhaumik, M. Chakraborty, S. Ghosh, S. Chakraborty and S. DasGupta, "Electric Field Enhanced Spreading of Partially Wetting Thin Liquid Films", *Langmuir*, 27(21), 12951–12959, 2011.
- 17) D. Chakraborty, G. Sai Sudha, S. Chakraborty and S. DasGupta, "Effect of submicron particles on Electrowetting on Dielectrics (EWOD) of sessile droplets", *Journal of Colloid and Interface Science*, 363, 640–645, 2011.
- 18) P. K. Kundu, S. Chakraborty, S. DasGupta, Experimental Investigation of Enhanced Spreading and Cooling from a Micro-grooved Surface, *Microfluidics and Nanofluidics*, 11, 489–499, 2011.
- 19) P.R. Mistry, F. M. Thakkar, S. De, S. DasGupta, A two dimensional model of the transient and steady state characteristics of a wicked heat pipe with experiments, *Experimental Heat Transfer*, 23, 333-348, 2010.
- 20) Prabhavathy Sivaprakash, S. DasGupta "Effect of air sparging on flux enhancement during tangential flow filtration of degreasing effluent", *Desalination and Water Treatment*, 1-11, 2013. DOI 10.1080/19443994.2013.839400.
- 21) P. Rai, G. C. Majumdar, S. DasGupta and S. De, Flux enhancement during ultrafiltration of depectinized mosambi (*Citrus sinensis* (L.) Osbeck) juice, *Journal of Food Process Engineering*, Vol 33 (3), 554-567, 2010.
- 22) C. Das, S. DasGupta, Y. T. Hung and S. De, Quantification of transient flux decline during membrane separation of tanning effluent from tannery, *International Journal of Environmental Engineering*, 2 (1/2/3), 31 – 42, 2010.
- 23) C. Das, S. DasGupta and S. De, "Treatment of dyeing effluent from tannery using membrane separation processes", *Int. J. Environ. Waste Manage*, 5(3-4), 354-367, 2010.
- 24) N. Saxena, C. Prabhavathy, S. De, S. DasGupta, Flux enhancement by argon - oxygen plasma treatment of polyethersulfone membranes, *Separation and Purification Technology*, 70, 160–165, 2009.
- 25) B. Sarkar, S. DasGupta and S. De, Flux decline during electric field assisted cross flow ultrafiltration of mosambi (*Citrus sinensis* (L.) Osbeck) juice, *Journal of Membrane Science*, 331 (1-2), 75-83, 2009.
- 26) B. Sarkar, S. DasGupta and S. De, Application of external electric field to enhance the permeate flux during micellar enhanced ultrafiltration", *Separation and Purification Technology*, 66 (2), 263-272, 2009.
- 27) A. Aggarwal, S. Agarwal, S. DasGupta and S. De, Performance prediction of membrane modules incorporating the effects of suction in the mass transfer coefficient under laminar and turbulent flow conditions for non-Newtonian fluids, *Journal of Food Process Engineering*, 32 (5), 752 – 774, 2009.
- 28) V. K. Jayanti, P. Rai, S. DasGupta and S. De, Quantification of flux decline and design of ultrafiltration system for clarification of tender coconut water, *Journal of Food Process Engineering*, 33 (1), 128-143, 2009.
- 29) M. K. Purkait, S. DasGupta and S. De, Determination of thermodynamic parameters for the cloud point extraction of different dyes using TX-100 and TX-114, *Desalination*, 244, 130-138, 2009.
- 30) S. Pal, S. Ghatak, S. De and S. DasGupta, "Evaluation of surface roughness of a plasma treated polymeric membrane by wavelet analysis and quantification of its enhanced performance" *Applied Surface Science*, 255, 2504-2511, 2008.

- 31) B. Sarkar, A. Sengupta, S. De and S. DasGupta, "Prediction of permeate flux during electric field enhanced cross-flow ultrafiltration—A neural network approach, *Separ. Purif. Technol.* 65, 260-268, 2009.
- 32) B. Sarkar, S. De and S. DasGupta, "Pulsed-electric field enhanced ultrafiltration of synthetic and fruit juice", *Separation and Purification Technology*, 63 (3), 582-591, 2008.
- 33) S. Pal, S. Ghatak, S. De and S. DasGupta, "Characterization of CO<sub>2</sub> Plasma Treated Polymeric Membranes and Quantification of Flux Enhancement" *Journal of Membrane Science*, 323 (1), 1-10, 2008.
- 34) S. Pal, Swati, T. B. Ghosh, S. De, S. DasGupta, "Optical evaluation of deposition thickness and measurement of permeate flux enhancement of simulated fruit juice in presence of turbulence promoters", *Journal of Membrane Science*, 315, (1-2), 58-66, 2008.
- 35) S. Pal, R. Bharihoke, S. Chakraborty, S. Ghatak, S. De and S. DasGupta, "An experimental and theoretical analysis of turbulence promoter assisted ultrafiltration of synthetic fruit juice", *Separation Science and Technology*, 62 (3), 659-66, 2008.
- 36) C. Das, S. DasGupta and S. De, Steady state modeling for membrane separation of pretreated soaking effluent under cross flow mode, *Environmental Progress*, 27, 346-352, 2008
- 37) P. Rai, C. Rai, G. C. Majumdar, S. DasGupta and S. De, Storage study of ultrafiltered mosambi (*Citrus sinensis [L.] Osbeck*) juice, *Journal of Food Processing and Preservation*, 32, 923-934, 2008.
- 38) C. Das, M. Rungta, G. Arya, S. DasGupta and S. De, Removal of dyes and their mixtures from aqueous solution using liquid emulsion membrane, *Journal of Hazardous Materials*, 159, 365-372, 2008.
- 39) B. Sarkar, S. Pal, T. B. Ghosh, S. De and S. DasGupta, "A study of electric field enhanced ultrafiltration of synthetic fruit juice and optical quantification of gel deposition", *Journal of Membrane Science*, 311, 112-120, 2008.
- 40) Chhaya, P. Rai, G. C. Majumdar, S. DasGupta and S. De, Clarification of watermelon (*citrulluslanatus*) juice by microfiltration, *Journal of Food Process Engineering*, 31, 768-782, 2008.
- 41) B. Sarkar, S. De and S. DasGupta, "Effect of electric field during gel-layer controlled ultrafiltration of synthetic and fruit juice", *Journal of Membrane Science*, 307, 268-276, 2008.
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- 43) C. Das, S. DasGupta and S. De, "Treatment of deliming-bating effluent from tannery using membrane separation processes" *Journal of Environment Protection Sciences*, 2, 11-24, 2008.
- 44) C. Das, S. DasGupta and S. De, "Separation of cation-anion mixture using micellar-enhanced ultrafiltration in a mixed micellar system", accepted in *Chemical Engineering Journal*, 144, 35-41, 2008.
- 45) C. Das, S. DasGupta and S. De, "Prediction of permeate flux and counterion binding during cross flow micellar enhanced ultrafiltration", *Journal of Colloids & Surfaces A: Physicochemical Aspects*, 318, 125-133, 2008.

- 46) A. Maity, S. DasGupta, J. K. Basu and S. De, "Batch and column study: Adsorption of Arsenate using untreated laterite as adsorbent", *Industrial and Engineering Chemistry Research*, 47, 1620-1629, 2008.
- 47) B. Sarkar, S. DasGupta and S. De, "Prediction of permeate flux during osmotic pressure controlled electric field enhanced cross flow ultrafiltration" *Journal of Colloid and Interface Science*, 319, 236-246, 2008.
- 48) C. Das, S. DasGupta and S. De, "Simultaneous separation of mixture of metal ions and aromatic alcohol using cross flow micellar enhanced ultrafiltration and recovery of surfactant", *Separation Science and Technology*, 43, 71-92, 2008.
- 49) R. Argade, S. Ghosh, S. De, S. DasGupta, "Experimental investigation of evaporation and condensation in the contact line region of a thin liquid film Experiencing Small Thermal perturbations" *Langmuir*, Vol. 23, No. 3, 1234-1241, 2007.
- 50) B. Sarkar, S. Pal, U. Banerjee, S. De, S. DasGupta, "Evaluation of Surface Charge by Electrokinetic Method of Ultrafiltration Membranes", *International Journal of Chemical Sciences*, 5, 1902-1912, 2007.
- 51) C. Das, P. Maity, R. Deb, S. DasGupta and S. De, "Optimization of composition of foam controlling agent for process industries", *International Journal of Chemical Science*, 5(4), 1947-1957, 2007.
- 52) C. Das, S. De and S. DasGupta, "Treatment of Soaking Effluent from Tannery using Membrane Separation Processes" *Desalination*, 216, 160-173, 2007.
- 53) P. Rai, G. C. Majumdar, S. DasGupta and S. De, "Modeling of permeate flux decline of synthetic fruit juice and mosambi juice (*Citrus sinensis* (L.) Osbeck) in stirred continuous ultrafiltration", *LWT Food Science and Technology*, 40, 1765-1773, 2007.
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- 55) A. Maiti, S. DasGupta, J. K. Basu and S. De, "Adsorption of arsenite using natural laterite as adsorbent" *Separation and Purification Technology*, 55, 350-359, 2007.
- 56) M. K. Purkait, A. Maiti, S. DasGupta, S. De, "Removal of congo red using activated carbon and its regeneration", *Journal of Hazardous Materials*, 145, 287-295, 2007.
- 57) S. Bhatia, S. DasGupta and S. De, "Performance prediction of membrane modules incorporating the effects of suction in the mass transfer coefficient under turbulent flow conditions", *Separation and Purification Technology*, 55, 182-190, 2007.
- 58) C. Das, S. De, S. DasGupta, "Treatment of liming effluent from tannery using membrane separation processes" *Separation Science and Technology*, 42, 517-539, 2007.
- 59) C. Das, S. DasGupta and S. De, "Selection of membrane separation processes for treatment of tannery effluent", *Journal of Environmental Protection Science* 1, 75-82, 2007.
- 60) P. Banerjee, S. DasGupta and S. De, "Removal of dye from aqueous solution using a combination of advanced oxidation process and nanofiltration" *Journal of Hazardous Materials*, 140, 95-103, 2007.
- 61) P. Rai, G. C. Majumdar, S. DasGupta and S. De, "Effect of various pretreatment methods on permeate flux and quality during ultrafiltration of mosambi juice", *Journal of Food Engineering*, 78, 561-568, 2007.

- 62) P. Rai, C. Rai, G. C. Majumdar, S. DasGupta and S. De, "Resistance in series model for ultrafiltration of mosambi(*Citrus sinensis* (L.) Osbeck) juice in a stirred continuous mode", Journal of Membrane Science, 283, 116-122, 2006.
- 63) A. Kumar, G. Das and S. DasGupta, An Approximate Analysis to Predict the Interface Shape for Stratified Two-Phase Systems in a Square Geometry, International Journal of Transport Phenomena, 8 (4), 359-370, 2006.
- 64) S. Pal, A. Ghosh, T. B. Ghosh, S. De and S. DasGupta, "Optical Quantification of Fouling during Nanofiltration of Dyes", Separation and Purification Technology, 52 (2), 372-379, 2006.
- 65) P. Rai, G. C. Majumdar, G. Sharma, S. DasGupta and S. De, "Effect of various Cutoff membranes on permeate flux and quality during filtration of mosambi(*Citrus sinensis* (L.) Osbeck) juice", Food and Byproduct Processing (Institute of Chemical Engineers, UK), 84, 213-219, 2006.
- 66) M. K. Purkait, S. DasGupta, S. De, " Performance of TX-100 and TX-114 for the separation of chrysoidine dye using cloud point extraction ", Journal of Hazardous Materials, 137, 827-835, 2006.
- 67) M. K. Purkait, S. DasGupta, S. De, " Micellar enhanced ultrafiltration of eosin dye using hexadecylpyridinium chloride ", Journal of Hazardous Materials, 136, 972-977, 2006.
- 68) M. K. Purkait, S. DasGupta, S. De, " Determination of design parameters for the cloud point extraction of congo red and eosin dyes using TX-100 ", Separation & Purification Technology, 51, 137-142, 2006.
- 69) C. Das, P. Patel, S. De and S. DasGupta, "Treatment of Tanning Effluent using Nanofiltration followed by Reverse Osmosis", Separation & Purification Technology, 50, 291-299, 2006.
- 70) S. Chakraborty, S. De, J. K. Basu and S. DasGupta, "Removal of reactive dyes from a textile effluent using adsorption", Industrial Engineering Chemistry Research, 45, 4732-4741, 2006.
- 71) P. Rai, G. C. Majumdar, V. K. Jayanti, S. DasGupta and S. De, " Alternate pretreatment methods to substitute enzyme treatment for clarification of mosambi juice using ultrafiltration", Journal of Food Process Engineering, 29 (2), 202-218, 2006.
- 72) P. Rai, G. C. Majumdar, S. DasGupta and S. De, "Modeling of Sucrose Permeation through a Pectin Gel during Ultrafiltration of Depectinized Mosambi (*Citrus sinensis* (L.) Osbeck) Juice", Journal of Food Science, E87-94, 71(2), 2006.
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- 74) P. Rai, G. C. Majumdar, S. DasGupta and S. De, "Quantification of flux decline of depectinized mosambi (*Citrus sinensis* (L.) Osbeck) juice using unstirred batch ultrafiltration", Journal of Food Process Engineering, 28, 359-377, 2005.
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- 80) S. Panchamgam, S. J. Gokhale, S. DasGupta, J. L. Plawsky, and P. C. Wayner, Jr., "Experimental determination of effect of disjoining pressure on shear in the contact line region of a moving evaporating thin film", *ASME Journal of Heat Transfer*, 27, pp. 231-243, 2005.
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- 85) M. K. Purkait, S. DasGupta, S. De, "Micellar enhanced ultrafiltration of phenolic derivatives from their mixture", *J. Colloid & Interf. Sci.*, 285, pp. 395-402, 2005.
- 86) S. Saha, S. Basu, S. DasGupta and S. De, "Modeling of gas solid reactions with ellipsoidal particles", *Ind. J. Engineering & Materials Sci.*, 12, 37-41, 2005.
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## SPONSORED RESEARCH PROJECTS

- “Droplet-based Cooling of Electronic Hot-Spots” Sponsored by ISRO 2014-2016 (PI).
- “Droplet based screening of Amyloid  $\beta$ -peptide aggregation”, Sponsored by Department of Biotechnology, 2011-2013. (PI)
- “Theoretical and experimental analysis of evaporation in the grooves of a micro heat pipe”, ISRO, 2011-2014. (PI)
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- “Indo-US Centre on Fabronics”, Sponsored by Indo-US Science and Technology Forum, New Delhi, 2008-2011. (Co-PI)
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- “Tuning the morphology of a porous carbon electrode for use with hydrogel electrolyte in electric double layer capacitor”, DST, 2012-2014. (Co-PI)
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- “Computational fluid dynamics modeling and flow visualization of a gas liquid mixture through a nozzle and subsequent spray”, sponsored by MHRD, 2003-2005. (PI)
- “Removal of toxic dyes from industrial effluent using a combination of adsorption and membrane separations”, sponsored by MHRD, 2001-2003. (Co-PI)

- “Development of micro grooved heat pipes: Performance modeling and experimental validation”, sponsored by Bhaba Atomic Research Center, Mumbai, 2001-2004. (PI)

## **Patents**

1. “Electric field assisted membrane separation of pectin”, Applied for Indian patent (697/KOL/2007).
2. “Membrane based water-extraction of polyphenols from green tea leaves”, Applied for Indian patent (1046/KOL/2007).
3. “Production of potassium rich organic fertilizer from tannery effluent”. Applied for Indian Patent (964/KOL/2008).
4. “Micro Heat Pipe for Electronic Cooling”, Applied for Indian patent (1748/KOL/2008).
5. “Development of High Capacity and Cost Effective Arsenic Adsorbent using Modified Laterite”, Applied for Indian Patent (614/KOL/2009).