

Curriculum Vitae

Siddhartha Das, PhD, FRSC

Notarization. I have read the following and certify that this *curriculum vitae* is a current and accurate statement of my professional record.

Signature 

Date: December 31, 2019

I. Personal Information

I.A. Contact Information

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I.B. Academic Appointments at University of Maryland (UMD)

Associate Professor, Department of Mechanical Engineering, A. James Clark School of Engineering August 23, 2019 onwards

Assistant Professor, Department of Mechanical Engineering, A. James Clark School of Engineering March 1, 2014 – August 22, 2019

I.C. Other Employment

Assistant Professor, Department of Mechanical Engineering, University of Alberta, Canada September, 2013 – February, 2014

Banting Postdoctoral Fellow, Department of Mechanical Engineering, University of Alberta, Canada April, 2012 – August, 2013

Postdoctoral Fellow, Department of Mechanical Engineering, University of Alberta, Canada December, 2011 – March, 2012

Postdoctoral Researcher, Physics of Fluids Group, University of Twente October, 2009 – October, 2010

I.D. Educational Background

Ph.D. – Indian Institute of Technology, Kharagpur
Department of Mechanical Engineering April, 2010*

B.Tech. (Hons.) – Indian Institute of Technology,
Kharagpur, Department of Mechanical Engineering May, 2005

I.E. Professional Memberships

American Physical Society	August, 2013 – Present
Materials Research Society	November, 2015 – Present
American Society of Mechanical Engineering	April, 2019 – Present
Royal Society of Chemistry	September 2019 – Present

All the formalities required for receiving the PhD degree were completed on **April, 2010, while the degree was formally awarded on **July, 2010**.*

II. Research, Scholarly, Creative and/or Professional Activities

II.A. Chapters

Book Chapters

1. **S. Das**, T. Das, and S. Chakraborty, Microfluidics based DNA hybridization, Microfluidics and Microscale Transport Processes, 2012, (Editor: S. Chakraborty) Taylor and Francis.
2. **S. Das**, J. Chakraborty, and S. Chakraborty, Electrokinetics in narrow confinements, Microfluidics and Microscale Transport Processes, 2012, (Editor: S. Chakraborty) Taylor and Francis.
3. **S. Das** and S. Chakraborty, Polymer transport in nanochannels, Microfluidics and Nanofluidics Handbook: Fabrication, Implementation and Applications-Vol II, 2011, (Editors: S. K. Mitra and S. Chakraborty), Taylor and Francis.

II.B. Refereed Journal Articles

*(# Indicates the Graduate Students or Postdocs of Dr. Das at UMD; \$ Indicates the Undergraduate Students or Summer Interns supervised by Dr. Das at UMD; *Indicates corresponding authorship)*

Total Citations: 3394, h-index: 31, i10-index: 81 (Google Scholar)

Google Scholar Link: <http://scholar.google.ca/citations?user=HPUsSB0AAAAJ>

Total Citations: 2399, h-index: 27 (ResearcherID.com)

ResearcherID Link: <http://www.researcherid.com/rid/G-9291-2017>

1. W. Gan, C. Chen, Z. Wang, Y. Pei, W. Ping, S. Xiao, J. Dai, Y. Yao, S. He, #B. Zhao, **S. Das**, B. Yang, P. B. Sunderland, and L. Hu, "Fire-Resistant Structural Material Enabled by An Anisotropic Thermally Conductive Hexagonal Boron Nitride Coating." *Advanced Functional Materials* (Accepted for Publication).
2. #T. H. Pial, #Y. Wang, and ***S. Das**, Non-Monotonic Dependence of Fluid Dissipation on Fluid Density in Fluid-Coupled Nanoresonators, *Applied Physics Letters* 2019, Vol. 115, pp. 251601.
3. #B. Zhao, #Y. Wang, #S. Sinha, C. Chen, D. Liu, A. Dasgupta, L. Hu, and ***S. Das**, Shape-driven Arrest of Coffee Stain Effect Drives the Fabrication of Carbon-Nanotube-Graphene-Oxide Inks for Printing Embedded Structures and Temperature Sensors. *Nanoscale* 2019, Vol. 11, pp. 23402–23415.
4. #H. S. Sachar, #V. S. Sivasankar, #S. A. Etha, G. Chen, and ***S. Das**, Ionic Current in Nanochannels Grafted with pH-Responsive Polyelectrolyte Brushes Modelled Using Augmented Strong Stretching Theory. *Electrophoresis* 2019, DOI: 10.1002/elps.201900248.
5. #Y. Gu, D. Park, S. Gonya, J. Jendrisak, **S. Das**, and D. R. Hines, Direct-write Printed Broadband Inductors. *Additive Manufacturing* 2019, Vol. 30, pp. 100843.
6. #N. Dalal, #Y. Gu, #G. Chen, D. R. Hines, A. Dasgupta, and **S. Das**, Effects of Gas Flow Rates on Quality of Aerosol Jet Printed Traces with Nanoparticle Conducting Ink. *ASME Journal of Electronic Packaging* 2019, DOI: 10.1115/1.4044960.
7. #N. Dalal, #Y. Gu, D. R. Hines, A. Dasgupta, and ***S. Das**, Cracks in the 3D-Printed Conductive Traces of Silver Nanoparticle Ink. *Journal of Micromechanics and Microengineering*, 2019, Vol. 29, pp. 097001.
8. #H. S. Sachar, #V. S. Sivasankar, and ***S. Das**, Electrokinetic Energy Conversion in Nanochannels Grafted with pH-responsive Polyelectrolyte Brushes Modelled Using Augmented Strong Stretching Theory. *Soft Matter*, 2019, Vol. 15, pp. 5973-5986.
9. #P. R. Desai, #Y. Wang, #H. S. Sachar, #H. Jing, #S. Sinha, and ***S. Das**, Supersolvophobic Soft Wetting: Nanoscale Elastocapillarity, Adhesion, and Retention of a Drop Behaving as a Nanoparticle. *Matter*, DOI: 10.1016/j.matt.2019.07.001 (2019).
10. K. Jiang, M. F. Khan, J. Thomas, #P. R. Desai, A. Phani, ***S. Das**, and T. Thundat, Thermomechanical Responses of Microfluidic Cantilever Capture DNA Melting and Properties of DNA Pre-melting States Using Picolitres of DNA Solution. *Applied Physics Letters*, 2019, Vol. 114, pp. 173703.
11. S. He, C. Chen, Y. Kuang, R. Mi, Y. Liu, Y. Pei, W. Kong, W. Gan, H. Xie, E. Hitz, C. Jia, X. Chen, A. Gong, J. Liao, J. Li, Z. J. Ren, B. Yang, **S. Das**, and Liangbing Hu, Nature-Inspired Salt Resistant Bimodal Porous Solar Evaporator for Efficient and Stable Water Desalination. *Energy and Environmental Science*, 2019, Vol. 12, pp. 1558-1567.
12. #H. S. Sachar, #V. S. Sivasankar, and ***S. Das**, Electrostatics and Interactions of an Ionizable Silica Nanoparticle Approaching a Plasma Membrane. *Langmuir* 2019, Vol. 35, pp. 4171-4181.
13. Y. Kuang, C. Chen, #G. Chen, Y. Pei, G. Pastel, C. Jia, J. Song, R. Mi, B. Yang, **S. Das**, L. Hu, Bioinspired Solar-Heated Carbon Absorbent for Efficient Clean-Up of Highly Viscous Crude Oil. *Advanced Functional Materials* 2019, Vol. 29, pp. 1900162.

14. T. Li, X. Zhang, S. D. Lacey, R. Mi, X. Zhao, F. Jiang, J. Song, Z. Liu, #G. Chen, J. Dai, Y. Yao, **S. Das**, R. Yang, R. Briber, L. Hu, Cellulose Ionic Conductors with High Differential Thermal Voltage for Low-Grade Heat Harvesting. *Nature Materials* 2019, DOI: 10.1038/s41563-019-0315-6.
15. #H. Jing, #H. S. Sachar, #S. Sinha, and ***S. Das**, Interactions of Gold and Silica Nanoparticles with Plasma Membranes get Distinguished by the van der Waals Forces: Implications for Drug Delivery, Imaging, and Theranostics. *Colloids and Surfaces B: Biointerfaces*, 2019, Vol. 177, pp. 433-439.
16. #H. Jing, #P. R. Desai, #Y. Wang, K. Ramamurthi, and ***S. Das**, Nanovesicles versus Nanoparticle-Supported Lipid Bilayers: Massive Differences in Bilayer Structures and in Diffusivities of Lipid Molecules and Nanoconfined Water. *Langmuir*, 2019, Vol. 35, pp. 2702-2708.
17. #H. S. Sachar, #V. S. Sivasankar, and ***S. Das**, Revisiting the Strong Stretching Theory for pH-Responsive Polyelectrolyte Brushes: Effects of Consideration of Excluded Volume Interactions and an Expanded Form of the Mass Action Law. *Soft Matter*, 2019, Vol. 15, pp. 559-574.
18. #Y. Gu, D. Park, D. Bowen, ***S. Das**, and *D. R. Hines, Direct write printed, solid-core solenoid inductors with commercially relevant inductances. *Advanced Materials Technologies*, 2019, Vol. 4, pp. 1800312.
19. C. Wang, S. Wang, G. Chen#, W. Kong, W. Ping, J. Dai, G. Pastel, H. Xie, S. He, **S. Das**, and L. Hu, Flexible, Bio-Compatible Nanofluidic Sodium Ion Conductor. *Chemistry of Materials*, 2018, Vol. 98, pp. 7707–7713.
20. #Y. Wang, #K. Ahuja, #S. Sinha, #P. R. Desai, and ***S. Das**, Water-Holey-Graphene Interactions: Route to Highly Enhanced Water-Accessible Graphene Surface Area. *ACS Applied Nano Materials*, 2018, Vol. 1, 5907–5919.
21. #Y. Wang, #S. Sinha, #P. R. Desai, #H. Jing, and ***S. Das**, Ion at air-water interface enhances capillary wave fluctuations: Energetics of ion adsorption. *Journal of the American Chemical Society*, 2018, Vol. 140, pp. 12853–12861.
22. #G. Chen, #J. Patwary, #H. S. Sachar, and ***S. Das**, Electrokinetics in nanochannels grafted with poly-zwitterionic brushes. *Microfluidics and Nanofluidics*, 2018, Vol. 22, pp. 122.
23. #R. S. Maheedhara, #H. Jing, #H. S. Sachar, and ***S. Das**, Highly enhanced liquid flows via thermoosmotic effects in soft and charged nanochannels. *Physical Chemistry Chemical Physics*, 2018, Vol. 20, pp. 24300-24316.
24. #P. R. Desai and **S. Das**, Lubrication in polymer-brush bilayers in the weak interpenetration regime: Molecular dynamics simulations and scaling theories. *Physical Review E*, 2018, Vol. 98, pp. 022503(1-7).
25. S. Karpitschka, **S. Das**, M. van Gorcum, H. Perrin, B. Andreotti, and J. H. Snoeijer, Soft Wetting: Models based on energy dissipation or on force balance are equivalent. *Proceedings of the National Academy of Sciences, USA*, 2018, Vol. 115, pp. E7233-E7233.
26. #R. S. Maheedhara, #H. S. Sachar, #H. Jing, and ***S. Das**, Ionic Diffusoosmosis in Nanochannels Grafted with End-Charged Polyelectrolyte Brushes. *The Journal of Physical Chemistry B*, 2018, Vol. 122, pp. 7450-7461.

27. #S. Sinha, #H. S. Sachar, and ***S. Das**, Electrostatically motivated design of biomimetic nanoparticles: Promoting specific adhesion and preventing nonspecific adhesion simultaneously. *Applied Physics Letters*, 2018, Vol. 112, pp. 243702(1-5).
28. #Y. Wang, #S. Sinha, #K. Ahuja, #P. R. Desai, J. Dai, L. Hu, and ***S. Das**, Dynamics of a Water Nanodrop Through a Holey Graphene Matrix: Role of Surface Functionalization, Capillarity, and Applied Forcing. *The Journal of Physical Chemistry C*, 2018, Vol. 122, pp. 12243-12250.
29. #G. Chen, #H. S. Sachar, and ***S. Das**, Efficient Electrochemomechanical Energy Conversion in Nanochannels Grafted with End-charged Polyelectrolyte Brushes at Medium and High Salt Concentration. *Soft Matter*, 2018, Vol. 14, pp. 5246-5255.
30. #S. Sinha, #H. Jing, #H. S. Sachar, and ***S. Das**, Surface charges promote nonspecific nanoparticle adhesion to stiffer membranes. *Applied Physics Letters*, 2018, Vol. 112, pp. 163702(1-5).
31. #G. Chen, #Y. Gu, H. Tsang, *D. R. Hines, and ***S. Das**, The effect of droplet sizes on overspray in aerosol-jet printing. *Advanced Engineering Materials*, 2018, Vol. 20, pp. 1701084(1-13).
32. #H. Jing and ***S. Das**, Theory of diffusioosmosis in a charged nanochannel. *Physical Chemistry Chemical Physics*, 2018, Vol. 20, pp. 10204-10212.
33. #P. R. Desai, #S. Sinha, and ***S. Das**, Polyelectrolyte brush bilayers in weak interpenetration regime: Scaling theory and molecular dynamics simulations. *Physical Review E*, 2018, Vol. 97, pp. 032503(1-8).
34. T. Li, H. Liu, X. Zhao, #G. Chen, J. Dai, G. Pastel, C. Jia, C. Chen, **S. Das**, R. Yang, and L. Hu, Scalable and Highly Efficient Mesoporous Wood-Based Solar Steam Generation Device: Localized Heat, Rapid Water Transport. *Advanced Functional Materials*, 2018, Vol. 28, pp. 1707134(1-8).
35. #H. Jing and ***S. Das**, Electric Double Layer electrostatics of lipid-bilayer-encapsulated nanoparticles: Towards a better understanding of protocell electrostatics. *Electrophoresis*, 2018, Vol. 39, pp. 752-759.
36. #S. Sinha, #H. S. Sachar, and ***S. Das**, Effect of Plasma Membrane Semipermeability in Making the Membrane Electric Double Layer Capacitances Significant. *Langmuir*, 2018, Vol. 34, pp. 1760-1766.
37. H. Liu, C. Chen, #G. Chen, Y. Kuang, X. Zhao, J. Song, C. Jia, X. Xu, E. Hitz, H. Xie, S. Wang, F. Jiang, T. Li, Y. Li, A. Gong, R. Yang, **S. Das**, and L. Hu, High-Performance Solar Steam Device with Layered Channels: Artificial Tree with a Reversed Design. *Advanced Energy Materials*, 2018, Vol. 8, pp. 1701616(1-8).
38. #S. Sinha, #H. Jing, #H. S. Sachar, and ***S. Das**, Role of plasma membrane surface charges in dictating the feasibility of membrane-nanoparticle interactions. *Applied Physics Letters*, 2017, Vol. 111, pp. 263702(1-5).
39. C. Jia, Y. Li, Z. Yang, #G. Chen, Y. Yao, F. Jiang, Y. Kuang, G. Pastel, H. Xie, B. Yang, **S. Das**, and L. Hu, Rich Mesosstructures Derived from Natural Woods for Solar Steam Generation. *Joule*, 2017, Vol. 1, pp. 588-599.
40. #Y. Wang, #S. Sinha, L. Hu, and ***S. Das**, Interaction between a Water Drop and Holey Graphene: Retarded Imbibition and Generation of Novel Water-Graphene Wetting States. *Physical Chemistry Chemical Physics*, 2017, Vol. 19, 27421-27434.
41. \$M. Zhu, \$Y. Li, \$#G. Chen, Z. Yang, X. Luo, #Y. Wang, J. Dai, S. D. Lacey, C. Wang, C. Jia, J. Wan, Y. Yao, B. Yang, Z. Yu, ***S. Das**, *L. Hu, Tree-Inspired Design

- for High-Efficiency Water Extraction. *Advanced Materials*, 2017, Vol. 29, pp. 1704107(1-9) (\$: Co-first authors).
42. #Y. Gu, *D. R. Hines, V. Yun, M. Antoniak, and ***S. Das**, Aerosol-Jet Printed Fillets for Well-Formed Electrical Connections Between Different Leveled Surfaces. *Advanced Materials Technologies*, 2017, Vol. 2, pp. 1700178(1-9).
 43. A. Pandey, S. Karpitschka, L. A. Lubbers, J. H. Weijs, L. Botto, **S. Das**, B. Andreotti, and J. H. Snoeijer, Dynamical Theory of the Inverted Cheerios Effect. *Soft Matter*, 2017, Vol. 13, 6000-6010.
 44. #S. Sinha, #H. Jing, and ***S. Das**, Positive zeta potential of a negatively-charged semi-permeable plasma membrane. *Applied Physics Letters*, 2017, Vol. 111, pp. 063702(1-5).
 45. #Y. Gu, D. Gutierrez, ***S. Das**, and *D. R. Hines, Inkwells for On-Demand Deposition Rate Measurement in Aerosol-Jet Based 3D Printing. *Journal of Micromechanics and Microengineering*, 2017, Vol. 27, pp. 097001(1-9).
 46. #P. R. Desai, #S. Sinha, and ***S. Das**, Compression of the polymer brushes in weak interpenetration regime: Scaling Theory and Molecular Dynamics Simulations. *Soft Matter*, 2017, Vol. 13, pp. 4159-4166.
 47. #Y. Wang, #J. E. Andrews, L. Hu, and ***S. Das**, Drop Spreading on a Superhydrophobic Surface: Pinned Contact Line and Bending Liquid Surface. *Physical Chemistry Chemical Physics*, 2017, Vol. 19, pp. 14442-14452.
 48. #J. E. Andrews, #Y. Wang, #S. Sinha, P. W. Chung, and ***S. Das**, Roughness-Induced Chemical Heterogeneity Leads to Large Hydrophobicity in Wetting-Translucent Nanostructures. *The Journal of Physical Chemistry C*, 2017, Vol. 121, pp. 10010-10017.
 49. F. Chen, A. Gong, M. Zhu, #G. Chen, S. Lacey, F. Jiang, Y. Li, #Y. Wang, J. Dai, Y. Yao, J. Song, B. Liu, K. K., **S. Das**, and L. Hu, Mesoporous, Three-Dimensional Wood Membrane Decorated with Nanoparticles for Highly Efficient Water Treatment. *ACS Nano*, 2017, Vol. 11, pp. 4275-4282.
 50. #S. Sinha, #H. Jing, and ***S. Das**, Charge Inversion and External Salt Effect in Semi-Permeable Membrane Electrostatics. *Journal of Membrane Science*, 2017, Vol. 533, pp. 364-377.
 51. #G. Chen and ***S. Das**, Massively enhanced electroosmotic transport in nanochannels grafted with end-charged polyelectrolyte brushes. *The Journal of Physical Chemistry B*, 2017, Vol. 121, 3130-3141.
 52. #H. Jing, #S. Sinha, and ***S. Das**, Elasto-electro-capillarity: Drop equilibrium on a charged, elastic solid. *Soft Matter*, 2017, Vol. 13, pp. 554-566.
 53. #G. Chen and ***S. Das**, Thermodynamics, electrostatics, and ionic current in nanochannels grafted with pH-responsive end-charged polyelectrolyte brushes. *Electrophoresis*, 2017, Vol. 38, 720-729.
 54. #S. Sinha, \$V. Padia, \$K. I. Bae, #G. Chen, and ***S. Das**, Effect of electric double layer on electro-spreading dynamics of electrolyte drops. *Colloids and Surfaces A: Physicochemical and Engineering Aspects*, 2017, Vol. 514, pp. 209-217.
 55. Y. Wang, G. Sun, J. Dai, #G. Chen, J. Morgenstern, #Y. Wang, S. Kang, M. Zhu, **S. Das**, L. Cui, and L. Hu, High-performance, low tortuosity wood carbon monolith reactor. *Advanced Materials*, 2017, Vol. 29, pp. 1604257(1-8).

56. M. Razi, #S. Sinha, P. R. Waghmare, *S. Das, and Thundat, T., Effect of Steam-Assisted Gravity Drainage (SAGD) produced water properties on oil/water transient interfacial tension. *Energy and Fuels*, 2016, Vol. 30, pp. 10714–10720.
57. #H. Li, #G. Chen, and *S. Das, Electric double layer electrostatics of pH-responsive spherical polyelectrolyte brushes in the decoupled regime. *Colloids and Surfaces B: Biointerfaces*, 2016, Vol. 147, pp. 180–190.
58. #S. Sinha, \$L. Myers, and *S. Das, Effect of solvent polarization on electroosmotic transport in a nanofluidic channel. *Microfluidics and Nanofluidics*, 2016, Vol. 20, pp. 119(1–14).
59. #G. Chen and *S. Das, Anomalous shrinking-swelling of nano-confined end charged polyelectrolyte brushes: Interplay of confinement and electrostatic effects. *Journal of Physical Chemistry B*, 2016, Vol. 120, pp. 6848–6857.
60. #J. Andrews, #S. Sinha, P. W. Chung, P. W., and *S. Das, Wetting dynamics of a water nanodrop on graphene. *Physical Chemistry Chemical Physics*, 2016, Vol. 18, pp. 23482–23493.
61. #G. Chen, #H. Li, and *S. Das (2016) Scaling relationships for spherical polymer brushes revisited. *Journal of Physical Chemistry B*, Vol. 120, pp. 5272–5277.
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63. Z. Liu, Y. Wang, Z. Wang, Y. Yao, J. Dai, *S. Das, and Hu. L. Solvo-thermal microwave-powered two-dimensional material exfoliation. *Chemical Communications*, 2016, Vol. 52, pp. 5757–5760.
64. #S. Sinha and *S. Das, Role of Shuttleworth effect in adhesion on elastic surfaces. *MRS Advances*, 2016, Vol. 1, pp. 621-630.
65. #J. Patwary, #G. Chen, and *S. Das, Efficient electrochemomechanical energy conversion in nanochannels grafted with polyelectrolyte layers with pH-dependent charge density. *Microfluidics and Nanofluidics*, 2016, Vol. 20, pp. 37(1–14).
66. #S. Sinha, \$K. I. Bae, and *S. Das, Electric double layer effects in water separation from water-in-oil emulsions. *Colloids and Surfaces A: Physicochemical and Engineering Aspects*, 2016, Vol. 489, pp. 216–222.
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68. #G. Chen and *S. Das, Electroosmotic transport in polyelectrolyte-grafted nanochannels with pH-dependent charge density. *Journal of Applied Physics*, 2015, Vol. 117, pp. 185304(1–9).
69. \$K. McDaniel, \$F. Valcius, \$J. Andrews, and *S. Das, Electrostatic potential distribution of a soft spherical particle with a charged core and pH-dependent charge density. *Colloids and Surfaces B: Biointerfaces*, 2015, Vol. 127, pp. 143–147.
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71. R. Gaikwad, A. Hande, S. Das, S. K. Mitra, and T. Thundat, Determination of charge on asphaltene nanoaggregates in air using electrostatic force microscopy. *Langmuir*, 2015, Vol. 31, pp. 679–684.
72. #G. Chen and *S. Das, Streaming potential and electroviscous effects in soft nanochannels beyond Debye-Huckel linearization. *Journal of Colloid and Interface Science*, 2015, Vol. 445, pp. 357–363.
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76. *S. Das, M. Banik, #G. Chen, #S. Sinha, and R. Mukherjee, Polyelectrolyte brushes: Theory, modelling, synthesis and applications. *Soft Matter*, 2015, Vol. 11, pp. 8550–8583.
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82. S. Das and A. Kumar, Formation and post-formation dynamics of bacterial biofilm streamers as highly viscous liquid jets. *Scientific Reports*, 2014, Vol. 4, pp. 7126(1–6).
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84. #S. Chanda, #S. Sinha, and *S. Das, Streaming potential and electroviscous effects in soft nanochannels: Towards designing more efficient nanofluidic electrochemomechanical energy converter. *Soft Matter*, 2014, Vol. 10, pp. 7558–7568.
85. L. A. Lubbers, J. H. Weijss, L. Botto, S. Das, B. Andreotti, and J. H. Snoeijer, Drop on soft solids: Free energy and double transition of contact angles. *Journal of Fluid Mechanics*, 2014, Vol. 747, pp. R1(1–12).
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- electrophoretic microchannel transport. *Colloids and Surfaces A: Physicochemical and Engineering Aspects*, 2014, Vol. 446, pp. 23–32.
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111. S. Das and S. Hardt, Electric-Double-Layer potential distribution in multiple-layer immiscible electrolytes. *Physical Review E*, 2011, Vol. 84, pp. 022502(1–5).
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II.C. Published Conference Proceedings

II.C.1. Refereed Conference Proceedings

1. **S. Das**, S. Chakraborty, T. Thundat, and S. K. Mitra, Asphaltene microchannel transport and separation in presence of finite wall effects. *Proceedings of the 22nd National and 11th International ISHMT-ASME Heat and Mass Transfer Conference, December 28-31, 2013, Indian Institute of Technology Kharagpur, India.*
2. D. Sarkar, **S. Das**, and S. K. Mitra, Effect of charge distribution at the three phase contact line for an electrolyte drop. *Proceedings of the ASME 2013 International Mechanical Engineering Congress and Exposition (IMECE 2013), (Paper No: 63357), November, 13–21, 2013, San Diego, California.*
3. P. R. Waghmare, **S. Das**, and S. K. Mitra, Drop deposition technique on low energy surface. *Proceedings of the ASME 2013 Fluids Engineering Division Summer Meeting, (Paper No: 16265), July 7–11, 2013, Incline Village, Nevada.*
4. A. Guha, **S. Das**, and S. K. Mitra, Streaming potential in a charged nanocapillary. *Proceedings of the 11th International Conference on Nanochannels, (Paper No: 6 73121), Microchannels, and Minichannels (ICNMM2013), June 16–19, 2013, Hokkaido University, Sapporo, Japan.*
5. **S. Das**, A. Guha, and S. K. Mitra, Electroviscous effects in charged nanocapillary. *Proceedings of the 24th Canadian Congress of Applied Mechanics (CANCAM 2013), (Paper No: 125), June 2–6, 2013, Saskatoon, Saskatchewan, Canada.*
6. P. Dubksy, **S. Das**, A. van den Berg, and J. C. T. Eijkel, Concentration polarization in nanochannel DNA electrophoresis. *Proceedings of the 15th International Conference on Miniaturized Systems for Chemistry and Life Sciences, October 2–6, 2011, Seattle, Washington.*
7. **S. Das** and S. Chakraborty, Effect of finite electric double layer conductivity on streaming potential and electroviscous effect in nanofluidic transport. *Proceedings of the 20th National and 9th International ISHMT-ASME Heat and Mass Transfer Conference, (Paper No: 10HMTTC89), January 4–6, 2010, Mumbai, India.*
8. **S. Das** and S. Chakraborty, Electroviscous effects in narrow fluidic confinements beyond the Debye-Hückel limits. *Proceedings of the IISc Centenary-International Conference on Advances in Mechanical Engineering (IC-ICAME), July 2–4, 2008, Bangalore, India.*
9. S. K. Das, **S. Das**, and S. Chakraborty, Molecular dynamics simulation of water flow through nanochannels. *Proceedings of the 19th National and 8th ISHMT-ASME Heat and Mass Transfer Conference, (Paper No: 046), January 3–5, 2008, JNTU Hyderabad, India.*
10. **S. Das**, S. Singh, and S. Chakraborty, Time-periodic electroosmotic transport of a non-Newtonian bio-fluid. *Proceedings of the 19th National and 8th ISHMTASME Heat and Mass Transfer Conference, January 3–5, 2008, JNTU Hyderabad, India.*
11. **S. Das** and S. Chakraborty, Role of substrate kinetics on macromolecular transport and hybridization in microchannels. *Proceedings of the 19th National and 8th ISHMT-ASME Heat and Mass Transfer Conference, January 3–5, 2008, JNTU Hyderabad, India.*
12. **S. Das**, T. Das, and S. Chakraborty, An integrated thermo-fluid analysis of electroosmotic separation of biological macromolecules in microchannels. *Proceedings of the 18th National and 7th ISHMT-ASME Heat and Mass Transfer Conference, January 4–6, 2006, Indian Institute of Technology Guwahati, India.*

II.D. Conferences, Workshops, and Talks

II.D.1. Invited Talks

1. Talk on “Water and Ion Transport in Micro-Nanochannels: Wood and Beyond” 1st Advanced Wood Nanotechnology Workshop, November 8, 2019, University of Maryland, College Park.
2. Talk on “*Confinement Effects in Densely-grafted Polyelectrolyte Brushes: Thermodynamics, Electrostatics, and Transport*” in the Polymer Networks Group meeting, May 17 – May 21, 2020, Potomac, MD (Scheduled).
3. Talk on “*Microfluidic Cantilever Spectroscopy Sensors*” in the *Nanotech 2019 Conference and Expo* (Session: *Micro & Bio Fluidics, Lab-On-Chip*), June 17 – June 19, 2019, Boston, MA.
4. Talk on “*Diffusioosmotic and Thermoosmotic Transport in Nanochannels Grafted with End-Charged Polyelectrolyte Brushes: Continuum Calculations and Molecular Dynamics Simulations*” in the Symposium titled *Multiscale Modeling of Soft Materials and Interfaces* at the 2018 Materials Research Society Fall Meeting and Exhibit, November 25 – November 30, 2018, Boston, MA.
5. Talk on “*Water at Nanoscale Interfaces*” at Annual Burger Symposium at College Park, MD on November 14, 2018 (Scheduled).
6. Talk on “3D-Printed Electronics” at *Intelligent Automation, Inc.* (a small business organization), Bethesda, MD on November 02, 2018.
7. Talk on “*Modeling Transport in Microfluidic Systems: Towards Better Equipping Ourselves for Solving Biomedical Engineering Problems*” at US Food and Drug Administration on June 28, 2018.
8. Talk on “*Water and Ions at Nanoscopic Interfaces: From 2-D materials to plasma membranes*” at Waterloo Institute of Nanotechnology in University of Waterloo, Canada on April 27, 2018.
9. Talk on “*Liquid at Complex Interfaces*” at National Institute of Standards and Technology, Gaithersburg, MD 20899 on February 22, 2018.
10. Talk on “*Liquid-Complex-Solid Interfaces*” at Harvard University, Cambridge, MA on November 28, 2016.
11. Talk on “*Thermodynamics, Fluidics, and Transport in Soft, Micronanoscale Systems: Biophysical and Bioengineering Applications*” at the National Heart, Lung, and Blood Institute, National Institutes of Health, Bethesda, MD 20892, USA on December 17, 2015.
12. Talk on “*Thermodynamics, transport, and adhesion at soft, charged interfaces*” at 2015 Materials Research Society Fall Meeting and Exhibit, Boston, Massachusetts, November 29 - December 4, 2015.

13. Talk on "*Wetting and Electrohydrodynamics of Soft surfaces*" at Fluid Dynamics Review Seminar, University of Maryland on April 24, 2015.
14. Talk on "*Wetting and Electrohydrodynamics of Soft surfaces*" at the Department of Chemical Engineering, University of Maryland on March 31, 2015.
15. Talk on "*Micro/nano-scale transport and applications*" at the Canada-India Collaboration in Nano Science and Technology in National Institute of Nanotechnology (NINT), University of Alberta on May 10, 2013.
16. Talk on "*Soft capillarity and wetting*" at the Department of Mechanical Engineering, University of Maryland on April 25, 2013.
17. Talk on "*Fluidics in micro-nanoscales: Applications in energy and biological systems*" at the Department of Mechanical Engineering, University of Alberta, Canada on February 28, 2013.
18. Talk on "*Fluidics at micro-nanoscales: Soft capillarity, superoleophobicity and bio-electrohydrodynamics*" at the Satyendra Nath Bose National Centre for Basic Science (SNBNCBS), Kolkata, India on February 1, 2013.
19. Talk on "*Fluidics at micro-nanoscales: Soft capillarity, superoleophobicity and bio-electrohydrodynamics*" at the Engineering Mechanics Units (EMU), Jawaharlal Nehru Centre for Advanced Scientific Research (JNCASR) Bangalore, India on January 30, 2013.
20. Talk on "*Fluidics at micro-nanoscales: Soft capillarity, superoleophobicity and bio-electrohydrodynamics*" at the Department of Physics, Indian Institute of Science (IISc) Bangalore, India on January 29, 2013.
21. Talk on "*Soft wetting at micro-nanoscales*" at the Department of Mechanical Engineering, Indian Institute of Technology (IIT) Kharagpur, India on January 16, 2013.
22. Talk on "*Fluidics at micro-Nanoscales: Soft capillarity, superoleophobicity and bio-electrohydrodynamics*" at the Simon Fraser University, British Columbia, Canada, on October 19, 2012.
23. Talk on "*Fluidics at micro-Nanoscales: Soft capillarity, superoleophobicity and bio-electrohydrodynamics*" at the Department of Mechanical Engineering, University of British Columbia on October 18, 2012.
24. Talk on "*Electrohydrodynamics and elastocapillary at nanoscales*" at the Centre of Smart Interfaces, Technische Universität Darmstadt, Germany on April 6, 2011.
25. Talk on "*Some issues of electrohydrodynamics in nanoscale*" at the Chair, Physics of Fluids, University of Twente, the Netherlands on November 30, 2009.
26. Talk on "*Electroviscous effects in narrow fluidic confinements*" at the IISc Centenary International Conference on Advances in Mechanical Engineering (IC-ICAME), held at Bangalore, India (July, 2008).

27. Talk on “*Combined pressure-driven and electroosmotic microchannel transport for enhanced DNA hybridization*” in Department of Mechanical Engineering, University of California, Irvine, USA (August, 2006).

II.D.2. Refereed Abstracts

(# Indicates the Graduate Students of Dr. Das in UMD; \$ Indicates the Undergraduate Students or Summer Interns supervised by Dr. Das in UMD; ^ Indicates the presenter)

1. #^P. R. Desai, **S. Das**, and K. C. Neuman, Molecular Dynamics Simulation of Supercoiled DNA with Mismatched Base Pair-Probing the Role of Structural Defect on Plectoneme Pinning. Abstract ID: C64.00005, *APS March Meeting, March 4–8, 2019, Boston, Massachusetts*.
2. #^Y. Wang, P. R. Desai, and S. Das, Energetics of the adsorption of iodide ion at the air-water interface. Abstract ID: K16.00005, *APS March Meeting, March 4–8, 2019, Boston, Massachusetts*.
3. ^**S. Das**, H. S. Sachar, and V. S. Sivasankar, Electrokinetics in pH-responsive polyelectrolyte-brush-grafted nanochannels: Effect of the appropriate Strong Stretching Theory representation of the polyelectrolytes. Abstract ID: K48.00008, *APS March Meeting, March 4–8, 2019, Boston, Massachusetts*.
4. #^H. Jing, #Y. Wang, #P. R. Desai, K. Ramamurthi, and S. Das, Nanovesicles versus Nanoparticle-Supported Lipid Bilayers: Differences in Equilibrium Structures and Properties Unraveled by Molecular Dynamics Simulations. Abstract ID: V65.00004, *APS March Meeting, March 4–8, 2019, Boston, Massachusetts*.
5. #^Y. Wang, #K. Ahuja, #S. Sinha, #P. Desai, #H. Jing, and **S. Das**, Capillarity-Driven Water-Holey-Graphene Interactions. Abstract ID: NM01.05.08, *2018 Materials Research Society Fall Meeting and Exhibit, Boston, Massachusetts, November 25 - November 30, 2018*.
6. #^P. R. Desai, **S. Das**, and K. Neuman, Supercoiled DNA with Mismatched Base Pair—Probing the Role of Structural Defect on Plectoneme Pinning by Molecular Dynamics Simulation. Abstract ID: BM03.03.16, *2018 Materials Research Society Fall Meeting and Exhibit, Boston, Massachusetts, November 25 - November 30, 2018*.
7. ^**S. Das**, #H. Jing, #P. Desai, #Y. Wang, and #S. Sinha, Drop on Superhydrophobic Soft Surface-Towards Designing Self-Cleaning Soft Surfaces. Abstract ID: BM03.08.05, *2018 Materials Research Society Fall Meeting and Exhibit, Boston, Massachusetts, November 25 - November 30, 2018*.
8. #^S. Sinha, #H. Jing, #H. S. Sachar, and **S. Das**, Specific Adhesion and Non-Specific Adhesion of Nanoparticles Influenced by the Surface Charge of Plasma Membranes. Abstract ID: BM03.07.05, *2018 Materials Research Society Fall Meeting and Exhibit, Boston, Massachusetts, November 25 - November 30, 2018*.
9. #^H. S. Sachar and **S. Das**, Revisiting the Strong Stretching Theory for pH-Responsive Polyelectrolyte Brushes. Abstract ID: BM03.01.08, *2018 Materials Research Society Fall Meeting and Exhibit, Boston, Massachusetts, November 25 - November 30, 2018*.
10. #Y. Wang, #S. Sinha, and ^**S. Das**, Understanding the self-assembly of the inkjet-printed CNT inks: Towards developing printable CNT inks. Abstract ID: P03.00006,

- APS March Meeting, March 5–9, 2018, Los Angeles, California.*
11. #K. Ahuja, #^Y. Wang, #S. Sinha, #P. R. Desai, and **S. Das**, Water-holey graphene interactions. Abstract ID: S46.00005, *APS March Meeting, March 5–9, 2018, Los Angeles, California.*
 12. #^S. Sinha, #H. Jing, #H. Sachar, and **S. Das**, Conditions on length of Ligand-Receptor pairs for nanoparticle adhesion influenced by plasma membrane surface charge. Abstract ID: V54.00012, *APS March Meeting, March 5–9, 2018, Los Angeles, California.*
 13. #S. Sinha, J. Singer, D. Hines, A. Dasgupta, and **S. Das**, Aerosol-Jet Printing of Compliant Ball Grid Array Pads. Abstract ID: PM04.09.37, *2017 Materials Research Society Fall Meeting and Exhibit, Boston, Massachusetts, November 26 - December 1, 2017.*
 14. #^P. R. Desai, #S. Sinha, and **S. Das**, Interdigitated Polyelectrolytes and Polymer Brushes—Weakly Interpenetration Regime. Abstract ID: BM11.13.10, *2017 Materials Research Society Fall Meeting and Exhibit, Boston, Massachusetts, November 26 - December 1, 2017.*
 15. #^G. Chen and **S. Das**, Environmental and Curvature Responsive PE Brushes. Abstract ID: PM03.07.14, *2017 Materials Research Society Fall Meeting and Exhibit, Boston, Massachusetts, November 26 - December 1, 2017.*
 16. #S. Sinha, H. Jing, and **S. Das**, Janus-Like Behavior and Charge Inversion in Negatively Charged Semi-Permeable Plasma Membrane. Abstract ID: BM01.09.09, *2017 Materials Research Society Fall Meeting and Exhibit, Boston, Massachusetts, November 26 - December 1, 2017.*
 17. #^G. Chen, Y. Gu, D. Hines, and **S. Das**, Shear Flow Instabilities and Droplet Size Effects on Aerosol Jet Printing Resolution. Abstract ID: BAPS.2017.DFD.KP1.28, *70th Annual Meeting of the APS Division of Fluid Dynamics, November 19–21, 2017, Denver, Colorado.*
 18. #^G. Chen and **S. Das**, Efficient Energy Conversion by Grafting Nanochannels with End-charged Stimuli-responsive Polyelectrolyte Brush. Abstract ID: BAPS.2017.DFD.L13.10, *70th Annual Meeting of the APS Division of Fluid Dynamics, November 19–21, 2017, Denver, Colorado.*
 19. #S. Sinha, D. Hines, A. Dasgupta, and **S. Das**, 3D Printing of Ball Grid Arrays. Abstract ID: BAPS.2017.MAR.S11.11, *APS March Meeting, March 13–17, 2017, New Orleans, Louisiana.*
 20. **S. Das**, #S. Sinha, and #H. Jing, Charge Inversion in semi-permeable membranes. Abstract ID: BAPS.2017.MAR.B5.10, *APS March Meeting, March 13–17, 2017, New Orleans, Louisiana.*
 21. #H. Jing, #S. Sinha, and **S. Das**, Drop equilibrium on charged, elastic surfaces. Abstract ID: BAPS.2017.MAR.C16.9, *APS March Meeting, March 13–17, 2017, New Orleans, Louisiana.*
 22. #P. R. Desai, #S. Sinha, and **S. Das**, Polymer brushes in weakly interpenetrating regimes. Abstract ID: BAPS.2017.MAR.S40.10, *APS March Meeting, March 13–17, 2017, New Orleans, Louisiana.*
 23. #^G. Chen and **S. Das**, Confinement effect on liquid and ion transport in nanochannels coated with environmental-stimuli-responsive polyelectrolyte (PE) brushes. Abstract ID: BAPS.2016.DFD.D11.2, *69th Annual Meeting of the APS*

- Division of Fluid Dynamics, November 20–22, 2016, Portland, Oregon.*
24. #^G. Chen, #S. Sinha, and **S. Das**, Scaling Laws for liquid and ion transport in nanochannels grafted with polyelectrolyte brushes. Abstract ID: BAPS.2016.MAR.P37.9, *APS March Meeting, March 14–18, 2016, Baltimore, Maryland.*
 25. #^J. Andrews, #S. Sinha, P. W. Chung, and **S. Das**, Spreading of water nanodroplets on graphene. Abstract ID: BAPS.2016.MAR.B53.10, *APS March Meeting, March 14–18, 2016, Baltimore, Maryland.*
 26. ^M. Hassanpourfard, Z. Nikakhtari, R. Ghosh, **S. Das**, T. Thundat, and A. Kumar, Bacterial floc mediated rapid streamer formation in creeping flows. Abstract ID: BAPS.2015.DFD.G24.2, *68th Annual Meeting of the APS Division of Fluid Dynamics, November 22–24, 2015, Boston, Massachusetts.*
 27. #^J. Patwary, #G. Chen, and **S. Das**, Streaming potential and energy conversion in nanochannel grafted with poly-zwitterion brushes. Abstract ID: BAPS.2015.DFD.R4.7, *68th Annual Meeting of the APS Division of Fluid Dynamics, November 22–24, 2015, Boston, Massachusetts.*
 28. #^G. Chen and **S. Das**, Electrokinetic transport in nanochannels grafted with polyelectrolyte brushes with end-charging. Abstract ID: BAPS.2015.DFD.G14.3, *68th Annual Meeting of the APS Division of Fluid Dynamics, November 22–24, 2015, Boston, Massachusetts.*
 29. #^S. Sinha and **S. Das**, Surface tension mediated under-water adhesion of rigid spheres on soft, charged surfaces. Abstract ID: BAPS.2015.DFD.G28.10, *68th Annual Meeting of the APS Division of Fluid Dynamics, November 22–24, 2015, Boston, Massachusetts.*
 30. **S. Das** and #^G. Chen, Electrokinetic transport in nanochannels grafted with polyelectrolyte with pH-dependent charge density. *International Technical Conference and Exhibition on Packaging and Integration of Electronic and Photonic Microsystems (InterPACK) and the International Conference on Nanochannels, Microchannels and Minichannels (ICNMM), (Presentation ID: 48246) July 6–9, 2015, San Francisco, California.*
 31. ^A. Kumar, M. Hassanpourfard, and **S. Das**, Low Reynolds number biofilm streamers form as highly viscous liquid jets. Abstract ID: BAPS.2014.DFD.E6.1, *67th Annual Meeting of the APS Division of Fluid Dynamics, November 23–25, 2014, San Francisco, California.*
 32. ^S. Karpitschka, **S. Das**, B. Andreotti, and J. H. Snoeijer, Dynamic contact angle of a soft solid. Abstract ID: BAPS.2014.DFD.H15.5, *67th Annual Meeting of the APS Division of Fluid Dynamics, 2014 Nov, November 23–25, 2014, San Francisco, California.*
 33. **S. Das**, Role of surface charges in drop-evaporation-triggered “coffee stain” formation. *9th International Conference on Two-Phase Systems for Ground and Space Applications, September 22–26, 2014, Baltimore, Maryland.*
 34. **S. Das**, S. K. Mitra, J. C. T. Eijkel, N. R. Tas, and S. Chakraborty, Inertial and Washburn regimes in filling of charged capillaries. BAPS.2013.DFD.D32.3, *66th Annual Meeting of the APS Division of Fluid Dynamics, November 24–26, 2013, Pittsburgh, Pennsylvania.*
 35. ^S. Mitra, P. Waghmare, and **S. Das**, New drop deposition technique for wettability

- characterization of under-liquid superoleophobic surfaces. Abstract ID: BAPS.2013.DFD.R33.8, *66th Annual Meeting of the APS Division of Fluid Dynamics, November 24–26, 2013, Pittsburgh, Pennsylvania.*
36. P. Waghmare, **S. Das**, and [^]S. K. Mitra, Technique for needle-free drop deposition: Pathway for precise characterization of superhydrophobic surfaces. Abstract ID: BAPS.2013.DFD.R33.7, *66th Annual Meeting of the APS Division of Fluid Dynamics, November 24–26, 2013, Pittsburgh, Pennsylvania.*
 37. [^]L. A. Lubbers, J. H. Weijs, **S. Das**, L. Botto, B. Andreotti, and J. H. Snoeijer, Interaction of drops on a soft substrate. BAPS.2013.DFD.L34.3, *66th Annual Meeting of the APS Division of Fluid Dynamics, November 24–26, 2013, Pittsburgh, Pennsylvania.*
 38. **^S. Das**, A. Guha, and S. K. Mitra, Electroviscous effects in charged nanocapillary. *Proceedings of the 24th Canadian Congress of Applied Mechanics (CANCAM 2013), (Paper No. 125) June 2–6, 2013, Saskatoon, Saskatchewan, Canada.*
 39. [^]S. Mitra and **S. Das**, Coffee stain effect with liquid droplets. Abstract ID: BAPS.2012.DFD.H8.1, *65th Annual Meeting of the APS Division of Fluid Dynamics, November, 18–20, 2012, San Diego, California.*
 40. [^]J. Snoeijer, B. Andreotti, **S. Das**, and A. Marchand, Contact angles on a soft solid: from Young's law to Neumann's law. Abstract ID: BAPS.2012.DFD.L19.5, *65th Annual Meeting of the APS Division of Fluid Dynamics, November 18–20, 2012, San Diego, California.*
 41. **S. Das**, O. Shardt, J. J. Derksen, [^]S. K. Mitra, Dynamics of microscale liquid droplets on micropatterned surfaces. *ASME 2012 International Mechanical Engineering Congress and Exposition (IMECE2012) (Paper ID: IMECE2012-86939), November 9–15, 2012, Houston, Texas.*
 42. S. Mitra and **^S. Das**, Influence of solvent polarization on Electric Double Layer interactions in nanochannels. Abstract ID: BAPS.2012.NWS.C4.8, *14th Annual Meeting of the APS Northwest Section, October 18–20, 2012, Simon Fraser University, Vancouver, British Columbia, Canada.*
 43. [^]S. Mitra and **S. Das**, Influence of solvent polarization on Electric Double Layer interactions in nanochannels. Abstract ID: BAPS.2012.NWS.C4.8, *14th Annual Meeting of the APS Northwest Section, October 18–20, 2012, Simon Fraser University, Vancouver, British Columbia, Canada.*
 44. **S. Das** and [^]S. K. Mitra, Effect of solvent polarization in nano-confined Electric Double Layer with finite ion sizes. *Pacific Rim Meeting (PRiME 2012) on Electrochemical and Solid State Science, October 7–12, 2012, Honolulu, Hawaii.*
 45. **^S. Das** and S. Chakraborty, Electroviscous effects in narrow fluidic confinements beyond the Debye-Hückel limits. *Proceedings of the IISc Centenary-International Conference on Advances in Mechanical Engineering (IC-ICAME), July 2–4, 2008, Bangalore, India.*
 46. **^S. Das**, S. DuttaRoy, and S. Chakraborty, Nonlinear effects in electrokinetic separation of charged macromolecules in nanochannels. *Proceedings of the Singapore International Chemistry Conference 5 (SICC5) and 7th Asia-Pacific International Symposium on Microscale Separation and Analysis (APCE 2007), 2007 Dec, December 16–19, 2007, Suntec City, Singapore.*

II.E. Sponsored Research and Programs – Administered by the Office of Research Administration (ORA)

II.E.1. Grants (Total Grant as PI: \$3.07 M, Total Share: \$2.1 M)

Title: Additive Manufacturing of Microscale Inductors for RF Applications
Funding Source: Advanced Manufacturing, Materials, and Processes, National Center for Manufacturing Sciences
Total Award Amount: \$300,000
Time Period: 1/2020 – 12/2020
Role: PI
co-PI: Abhijit Dasgupta, Ryan Sochol
Share: \$100,000

Title: Direct-Write Electronic Printing for RF Electronics Sustainment
Funding Source: Maryland Center for Excellence for Sustainment Sciences (supported by Lockheed Martins)
Total Award Amount: \$200,000
Time Period: 10/2019 – 09/2020
Role: PI
co-PI: Abhijit Dasgupta
Share: \$140,000

Title: Surface Effects on Fluid Flows in 3D Printed Micro-channels: Computational Simulations with Empirical Validation
Funding Source: National Science Foundation
Total Award Amount: \$100,000
Time Period: 1/2020 – 12/2020
Role: PI
Share: \$100,000

Title: 3D-Printed Electronics on Non-flat Surfaces
Funding Source: Laboratory for Physical Sciences
Total Award Amount: \$684,245*
Time Period: 4/2019 – 12/2023
Role: PI
co-PI: Abhijit Dasgupta
Share: \$478,971*

*These numbers are based on the committed support from the LPS (i.e., support for one postdoc for 57 months from 4/2019 – 12/2023, support for summer salaries of Prof. Das and Prof. Dasgupta consumables, and travel)

Title: 3D printing of conductive inks on curved substrates: printability and reliability
Funding Source: Harris Corporation through CALCE
Total Award Amount: \$20,000
Role: PI
Co-I: Abhijit Dasgupta

Share: \$10,000

Title: Conformal 3-D Printed Carbon-Nanotube-Reinforced Composites

Funding Source: NAVAIR (U.S. Navy Naval Air Systems Command)

Total Award Amount: \$80,000

Period of Funding: 01/2018 – 09/2018

Role: PI

Co-I: None

Title: Probing Water-Holey-Graphene Interactions for Removing Lead from Water and Oil-Water Separation

Funding Source: Center for Engineering Concepts Development (CECD)

Total Award Amount: \$25,000

Time Period: 10/2016 – 09/2018

Role: PI

co-PI: None

Share: \$25,000

Title: Polyelectrolyte-Grafted Nanochannels for Enhanced Electrochemomechanical Energy Conversion

Funding Source: U.S. Department of Energy

Total Award Amount: \$450,000

Time Period: 09/2017 – 11/2020

Role: PI

co-PI: Peter W. Chung

Share: \$450,000

Title: Conformal Printing of Conductors and Dielectrics Onto Complex 3-D Surfaces

Funding Source: NextFlex

Total Award Amount: \$500,000

Time Period: 04/2017 – 09/2018

Role: PI

co-PI: Abhijit Dasgupta

Share: \$250,000

Title: Conformal 3-D Printed Carbon-Nanotube-Reinforced Composites

Funding Source: NAVAIR (U.S. Navy Naval Air Systems Command)

Total Award Amount: \$80,000

Period of Funding: 01/2017 – 09/2017

Role: PI

co-PI: None

Title: Conformal Electronic Circuits on Curvilinear 3-D Printed Structures

Funding Source: Laboratory for Physical Sciences

Total Award Amount: \$352,885*

Time Period: 10/2016 – 3/2019

Role: PI

co-PI: Abhijit Dasgupta

Share: \$247,019*

*These numbers are based on the committed support from the LPS (i.e., support for one postdoc for 30 months from 10/2016 to 03/2019, support for summer salaries of Prof. Das and Prof. Dasgupta, and consumables)

Title: 3-D Printing for Direct-Write printed Ball Grid Arrays (BGAs) as substitution for Solder bumped BGAs

Funding Source: Laboratory for Physical Sciences

Total Award Amount: \$205,678

Time Period: 01/2016 – 12/2017

Role: PI

co-PI: Abhijit Dasgupta

Share: \$143,974.60

Title: Evaporation-triggered nanocomposite formation for aerospace applications

Funding Source: Minta Martin Funding, A. James Clark School of Engineering, University of Maryland, College Park

Total Award Amount: \$75,000

Time Period: 10/2014 – 06/2016

Role: PI

co-PI: None

Share: \$75,000

II.E.2. Contracts

Title: Service Contract for Microfluidics Study

Funding Source: The US Food and Drug Administration

Total Award Amount: \$8,000

Time Period: 07/2017– 03/2018

Role: PI

co-PI: None

II.F. Gifts, and Funded Research not administered by ORA

II.F.1. Other

Program: Graduate Partnership Program between University of Maryland and National Heart, Lung and Blood Institute (NHLBI), NIH

Award: Support for 1 PhD student for 2 years and renewable for the 3rd year (salary of the student comes directly from NIH)

Project Title: Polymer dynamics simulations of DNA topology and mechanisms of topoisomerase activity

Role: PI (UMD)

Collaborator: Dr. Keir Neuman (PI, NHLBI, NIH)

Program: UMD-NCI Partnership for Integrative Cancer Research

Award: Support for 1 PhD student for 4 years (salary of the student comes directly from NIH)

Project Title: Curvature-driven membrane-protein interactions

Role: PI (UMD)

Collaborator: Dr. Kumaran Ramamurthi (PI, CCR, NCI, NIH)

II.G. Patents

(# Indicates the Graduate Students or Postdocs of Dr. Das at UMD)

1. G. Chen#, **S. Das**, Y. Gu#, and D. R. Hines, Method for the Quantitative Determination of Overspray Related to Aerosol-Jet Printed Lines. US provisional application No. 62/641060 (2018) (Provisional Patent application submitted on March, 2018).

II.H. Research Fellowship, Prizes, and Awards

II.H.1. Research Fellowship, Prizes, and Awards of Dr. Siddhartha Das

Award: Honoree at University of Maryland's Maryland Research Excellence Celebration.

Description of the Award: This award was bestowed to Prof. Das to recognize his research contributions in 2019 that have "*demonstrably elevated the visibility and reputation of the University of Maryland Research Enterprise*".

Year: 2020

Award: Selected for invitation to the inaugural Physical Chemistry Chemical Physics (PCCP) Emerging Investigators Themed Issue

Description of the Award: This recognition is for the selected short-listed nominees (for the 2019 PCCP Emerging Investigator Lectureship), as chosen by the [PCCP Editorial Board](#).

Year: 2019

Fellowship: Elected as the Fellow of the Royal Society of Chemistry

Year: 2019

Award: Honoree at University of Maryland's Inaugural Maryland Research Excellence Celebration.

Description of the Award: This award was bestowed to Prof. Das based on his research contributions in 2018. A total of 200 professors from the entire university were honored.

Year: 2019

Award: Hind Rattan Award (Hindi Phrase when translated to English means "Jewel of India") by NRI Welfare Society of India

Description of the Award: Prof. Das has been selected to receive the award in a function in Bangalore, India on January 9, 2019 for his "Outstanding services, contributions and achievements" in his professional field. This award is one of the highest Indian diasporic awards granted annually to non-resident persons of Indian

origin (NRIs).

Year: 2019

Award: Indian Institute of Technology Kharagpur (IITKGP) Young Alumni Achiever Awards 2018

Description of the Award: These awards started by IITKGP in 2018 “recognize alumni age 40 or younger who have demonstrated emerging and unique innovation, creativity and success in his or her chosen career.”
(<http://alumni.iitkgp.ac.in/Alumniweb/AchieverAward>)

(Announcement of the award: http://smiel.umd.edu/slide/iit-kharagpur-young-alumni-achiever-award_trashed/36559533_388627534877164_8348315086435123200_o/#lightbox/0/)

Year: 2018

Award: Selection as Editorial Board Member of *Scientific Reports*

Description of the Award: Selected to be an Editorial Board Member in the Fluids and Plasma Physics category

Year: 2017

Award: Outstanding Reviewer Recognition

Description of the Award: Recognized as the *Outstanding Reviewer* for the journal *International Journal of Non-linear Mechanics*

Year: 2015

Award: Outstanding Mentor for PROMISE AGEP Program

Description of the Award: Nominated as the *Outstanding Mentor* for the University System of Maryland PROMISE AGEP program for STEM Education for underrepresented minorities

Year: 2015

Award: Honoree in 8th Annual University-Wide Celebration of Scholarship and Research (University of Maryland, College Park)

Description of the Award: This honor was bestowed on Dr. Das based on his 2014 paper streamer formation in *Scientific Reports*.

Year: 2015

Award: Banting Postdoctoral Fellowship (2011-2012)

Description of the Award: This fellowship is the most prestigious postdoctoral fellowship offered by *Natural Sciences and Engineering Research Council (NSERC), Canada*. Secured a rank of 4 out of 214 international applicants in the competition.

Year: 2012

Award: Emerald Engineering Outstanding Doctoral Research Awards

Description of the Award: This award recognizes the best PhD dissertation worldwide in the area of *Numerical Heat Transfer & Computational Fluid Dynamics*

Year: 2011

Award: High Value PhD Fellowship

Description of the Award: This Fellowship was used to be offered every year by the Indian Institute of Technology, Kharagpur to the topmost PhD students of the institute

Year: 2007

Award: National Doctoral Fellowship

Description of the Award: This fellowship is offered by All India Council of Technical Education (AICTE) to a very selected group of Engineering PhD candidates across India.

Year: 2006

Award: Innovative Students Project Award (Undergraduate Level)

Description of the Award: This award is offered by Indian National Academy of Engineering (INAE) to the most outstanding undergraduate research projects in India.

Year: 2005

Award: S.P. Sengupta Memorial Award

Description of the Award: This award is offered by Indian Institute of Technology (IIT) Kharagpur, India for the best undergraduate project on Computational Fluid Dynamics

Year: 2005

II.H.2. Students' Awards and Recognitions (Awards and recognitions received by graduate and undergraduate students advised by Dr. Siddhartha Das)

Mr. Harnoor Singh Sachar (Current PhD student of Dr. Das) was selected as one of the nominees from the Department of Mechanical Engineering UMD for the Outstanding Graduate Assistant Award for 2019 offered by the Graduate School, University of Maryland (December, 2019).

Dr. Shayandev Sinha (Former PhD student of Dr. Das) won the Department of Mechanical Engineering, UMD best PhD Dissertation award for 2018.

Mr. Haoyuan Jing (Current PhD student of Dr. Das) was selected for the 2019 Future Faculty Program of the A. James Clark School of Engineering School of University of Maryland, College Park (December, 2018).

Mr. Parth Rakesh Desai (Current PhD student of Dr. Das) was selected for the STLE (Society for Tribologists and Lubrication Engineers) Scholarship (July, 2018).

Dr. Shayandev Sinha (Former PhD student of Dr. Das) was selected for the Outstanding Graduate Assistant Award for 2018 offered by the Graduate School, University of Maryland (April, 2018).

Dr. Guang Chen (Former PhD student of Dr. Das) won the Department of Mechanical Engineering, UMD best PhD Dissertation award for 2017.

Mr. Yanbin Wang (Current PhD student of Dr. Das) was selected for the 2018 Future Faculty Program of the A. James Clark School of Engineering School of University of Maryland, College Park (December, 2017).

Dr. Shayandev Sinha (Former PhD student of Dr. Das) was selected for receiving the STLE (Society for Tribologists and Lubrication Engineers) Scholarship (July, 2017).

GEMSTONE Team (TEAM BACTERIA), mentored by Dr. Siddhartha Das, wins the best poster award in the Junior Year Level Poster presentation (April, 2017).

Mr. Joseph Andrews (Former M.S. student of Dr. Das) won the Department of Mechanical Engineering, UMD best M.S. Thesis award for 2016.

Dr. Shayandev Sinha (Former PhD student of Dr. Das) was selected for the 2017 Future Faculty Program of the A. James Clark School of Engineering School of University of Maryland, College Park (December, 2016).

GEMSTONE Team (TEAM BACTERIA), mentored by Dr. Siddhartha Das won \$5000 UMD Sustainability Fund to support research involving the use of bacteria-produced enzymes for breaking asphaltenes for heavy oil recovery (December, 2016).

Dr. Shayandev Sinha (Former PhD student of Dr. Das) was selected for the Outstanding Graduate Assistant Award for 2015 offered by the Graduate School, University of Maryland (April, 2016).

Dr. Shayandev Sinha (Former PhD student of Dr. Das) received the Kulkarni Graduate Student Summer Research Fellowship for Summer 2016 offered by the Graduate School, University of Maryland (April, 2016).

Dr. Shayandev Sinha (Former PhD student of Dr. Das) was recognized by ASME for taking part in Family Day in Washington DC (March, 2016).

Dr. Shayandev Sinha (Former PhD student of Dr. Das) chosen as one among 37 students for serving in the ASME's International Petroleum Technology Institute Collegiate Council (December, 2015).

Dr. Guang Chen (Former PhD student of Dr. Das) selected for the 2016 Future Faculty Program of the A. James Clark School of Engineering School of University of Maryland, College Park (December, 2015).

Dr. Guang Chen (Former PhD student of Dr. Das) received the Northrup Grumman Graduate Fellowship in Engineering Education for the 2015-2016 academic year (November, 2015).

Dr. Guang Chen (Former PhD student of Dr. Das) was selected as a finalist in the Clean Energy Education & Empowerment (C3E) Women in Clean Energy symposium (October, 2015).

II.H.3. Journal Cover Articles

1. #H. S. Sachar, #V. S. Sivasankar, and ***S. Das**, Revisiting the Strong Stretching Theory for pH-Responsive Polyelectrolyte Brushes: Effects of Consideration of Excluded Volume Interactions and an Expanded Form of the Mass Action Law. *Soft Matter*, 2019, Vol. 15, pp. 559-574 ([Selected as the Back Cover for the January 28, 2019 issue of the journal Soft Matter](#))
2. #G. Chen, #Y. Gu, H. Tsang, *D. R. Hines, and ***S. Das**, The effect of droplet sizes on overspray in aerosol-jet printing. *Advanced Engineering Materials*, 2018, Vol. 20, pp. 1701084(1-13). ([Selected as the Back Cover for the August 2018 issue of the journal](#)).
3. #H. Jing, #S. Sinha, and ***S. Das**, Elasto-electro-capillarity: Drop equilibrium on a charged, elastic solid. *Soft Matter*, 2017, Vol. 13, pp. 554-566. ([Selected as the inside back cover article in the January 21, 2017 issue of the journal Soft Matter](#))
4. #J. Andrews, #S. Sinha, P. W. Chung, P. W., and ***S. Das**, Wetting dynamics of a water nanodrop on graphene. *Physical Chemistry Chemical Physics*, 2016, Vol. 18, pp. 23482–23493. ([Selected as the inside front cover article in the September 14, 2016 issue of the journal Physical Chemistry Chemical Physics](#)).
5. K. McDaniel, F. Valcius, J. Andrews, and ***S. Das**, Electrostatic potential distribution of a soft spherical particle with a charged core and pH-dependent charge density. *Colloids and Surfaces B: Biointerfaces*, 2015, Vol. 127, pp. 143–147 ([Selected as the cover article in the March 2015 issue of the journal Colloids and Surfaces B: Biointerfaces](#)).
6. P. R. Waghmare, **S. Das**, and S. K. Mitra, Drop deposition on under-liquid low energy surfaces. *Soft Matter*, 2013, Vol. 9, pp. 7437–7447 ([Selected as the Front Cover Article in the August 21, 2013 issue of the journal Soft Matter](#)).

II.H.4. Media Coverage for research and awards of Dr. Das and his students

Prof. Das' Election to the Royal Society of Chemistry as a Fellow

Year: 2019

<https://enme.umd.edu/news/story/das-admitted-as-fellow-to-the-royal-society-of-chemistry>

Matter Paper on Drop Behaving as a Nanoparticle in Elastocapillary Action

Year: 2019

<https://eng.umd.edu/news/story/umd-researchers-discover-nanoparticlelike-behavior-of-a-liquid-drop-acts-like-velcro-on-specially>

<https://enme.umd.edu/news/story/umd-researchers-discover-nanoparticlelike-behavior-of-a-liquid-drop-acts-like-velcro-on-specially>

***Nature Materials* Paper on Thermoelectricity Generation in Wood**

Year: 2019

<https://www.sciencedaily.com/releases/2019/03/190325163014.htm>

https://www.eurekalert.org/pub_releases/2019-03/uom-urw032519.php

<https://phys.org/news/2019-03-wood-based-technology-electricity.html>

<https://www.nanowerk.com/nanotechnology-news2/newsid=52444.php>

http://www.nanotech-now.com/news.cgi?story_id=55576

<https://www.freepressjournal.in/technology/wood-based-flexible-tech-creates-electricity-from-body-heat/1490778>

https://www.business-standard.com/article/pti-stories/wood-based-flexible-tech-creates-electricity-from-body-heat-119032700367_1.html

<https://www.rdmag.com/news/2019/03/umd-led-researchers-wood-based-technology-creates-electricity-heat>

<https://indianexpress.com/article/technology/science/wood-based-flexible-tech-creates-electricity-from-body-heat-5646775/>

<https://energy.economictimes.indiatimes.com/news/power/wood-based-flexible-tech-creates-electricity-from-body-heat/68594047>

<https://www.ecnmag.com/news/2019/03/using-wood-generate-electricity-heat>

<https://eng.umd.edu/news/story/woodbased-technology-creates-electricity-from-heat>

<https://today.umd.edu/briefs/wood-based-technology-creates-electricity-heat-2eaff663-fad9-44d4-ba28-9b62489ccc88>

Back Cover Article of *Soft Matter*

Year: 2019

<https://enme.umd.edu/news/story/clark-school-research-featured-on-back-cover-ofnbspsoft-matter>

<https://eng.umd.edu/news/story/clark-school-research-featured-on-back-cover-ofnbspsoft-matter>

Haoyuan Jing's selection to Future Faculty Program for 2017-2018

Year: 2019

<https://enme.umd.edu/news/story/eight-mechanical-engineering-students-accepted-to-future-faculty-program>

Parth Desai's selection to receive STLE Fellowship

Year: 2018

<https://enme.umd.edu/news/story/desai-and-kaushik-receive-stle-fellowshipnbsp>

JACS paper of Dr. Siddhartha Das

Year: 2018

https://enme.umd.edu/news/news_story.php?id=11637

APL paper of Dr. Siddhartha Das

Year: 2018

http://enme.umd.edu/news/news_story.php?id=11347

PRE paper of Dr. Siddhartha Das

Year: 2018

<https://eng.umd.edu/news/story/new-research-on-polyelectrolyte-brush-bilayers-published-in-pre>

http://enme.umd.edu/news/news_story.php?id=11242

APL paper of Dr. Siddhartha Das

Year: 2018

http://www.enme.umd.edu/news/news_story.php?id=11046

Yanbin Wang's selection to Future Faculty Program for 2017-2018

Year: 2017

http://enme.umd.edu/news/news_story.php?id=11060

Joule paper of Dr. Siddhartha Das

Year: 2017

<https://www.sciencedaily.com/releases/2017/11/171115130931.htm>

Advanced Materials paper of Dr. Siddhartha Das

Year: 2017

<http://www.advancedsciencenews.com/natural-wood-clean-water/>

<https://www.sciencedaily.com/releases/2017/10/171010224556.htm>

http://enme.umd.edu/news/news_story.php?id=10851

APL paper of Dr. Siddhartha Das

Year: 2017

http://enme.umd.edu/news/news_story.php?id=10748

NextFlex Funding of Dr. Siddhartha Das

Year: 2017

http://enme.umd.edu/news/news_story.php?id=10591

ACS Nano paper of Dr. Siddhartha Das

Year: 2017

<http://indiatoday.intoday.in/story/now-wooden-filter-to-purify-water/1/948463.html>

http://www.business-standard.com/article/pti-stories/now-wooden-filter-to-purify-water-117050800523_1.html

<https://phys.org/news/2017-04-wood-filter-toxic-dye.html>

<http://www.woodworkingnetwork.com/technology/filtering-water-new-use-wood>

<http://www.brecorder.com/2017/05/08/347469/wood-can-now-be-used-to-filter-water/>

<https://www.sciencedaily.com/releases/2017/05/170504173349.htm>

http://www.newswise.com/doescience/?article_id=674160&returnurl=aHR0cDovL3d

[3dy5uZXdzd2lzZS5jb20vYXJ0aWNsZXMvbGlzdA==
http://enme.umd.edu/news/news_story.php?id=10484](http://enme.umd.edu/news/news_story.php?id=10484)
<http://eng.umd.edu/news/story/wood-filter-removes-toxic-dye-from-water>

NAVAIR Funding of Dr. Siddhartha Das

Year: 2017

http://enme.umd.edu/news/news_story.php?id=10367

Shayandev Sinha's selection to Future Faculty Program for 2016-2017

Year: 2017

http://enme.umd.edu/news/news_story.php?id=10356

Soft Matter Back Cover Article on Drop Statics on Charge, Elastic Substrate

Year: 2017

http://eng.umd.edu/html/news/news_story.php?id=10267

Selection of Dr. Siddhartha Das as Editorial Board Member of Scientific Reports

Year: 2017

http://www.enme.umd.edu/news/news_story.php?id=10266

GEMSTONE Team (Team BACTERIA) mentored by Dr. Siddhartha Das wins the \$5000 UMD Sustainability Fund

Year: 2016

http://enme.umd.edu/news/news_story.php?id=10157

http://eng.umd.edu/html/news/news_story.php?id=10157

Physical Chemistry Chemical Physics Inside Cover Article on Graphene's Wetting Dynamics

Year: 2016

http://www.enme.umd.edu/news/news_story.php?id=9929

Paper on Inverted Cheerios effect in drop-drop interactions on soft solid published in PNAS

Year: 2016

Article on extracrispy.com (Breakfast site of TIME Magazine):

<http://www.extracrispy.com/food/2048/how-cheerios-may-help-cure-cancer>

New York Times Article: [http://www.nytimes.com/2016/07/14/science/inverted-cheerios-effect-returns-physics-to-the-breakfast-](http://www.nytimes.com/2016/07/14/science/inverted-cheerios-effect-returns-physics-to-the-breakfast-table.html?rref=collection%2Fcolumn%2Ftrilobites&action=click&contentCollection=science®ion=stream&module=stream_unit&version=latest&contentPlacement=1&pgtype=collection)

[table.html?rref=collection%2Fcolumn%2Ftrilobites&action=click&contentCollection=](http://www.nytimes.com/2016/07/14/science/inverted-cheerios-effect-returns-physics-to-the-breakfast-table.html?rref=collection%2Fcolumn%2Ftrilobites&action=click&contentCollection=science®ion=stream&module=stream_unit&version=latest&contentPlacement=1&pgtype=collection)

[science®ion=stream&module=stream_unit&version=latest&contentPlacement=1&](http://www.nytimes.com/2016/07/14/science/inverted-cheerios-effect-returns-physics-to-the-breakfast-table.html?rref=collection%2Fcolumn%2Ftrilobites&action=click&contentCollection=science®ion=stream&module=stream_unit&version=latest&contentPlacement=1&pgtype=collection)

[pgtype=collection](http://www.nytimes.com/2016/07/14/science/inverted-cheerios-effect-returns-physics-to-the-breakfast-table.html?rref=collection%2Fcolumn%2Ftrilobites&action=click&contentCollection=science®ion=stream&module=stream_unit&version=latest&contentPlacement=1&pgtype=collection)

[table.html?rref=collection%2Fcolumn%2Ftrilobites&action=click&contentCollection=](http://www.nytimes.com/2016/07/14/science/inverted-cheerios-effect-returns-physics-to-the-breakfast-table.html?rref=collection%2Fcolumn%2Ftrilobites&action=click&contentCollection=science®ion=stream&module=stream_unit&version=latest&contentPlacement=1&pgtype=collection)

Clark's School Webpage: http://eng.umd.edu/html/news/news_story.php?id=9788

<http://phys.org/news/2016-06-scientists-inverted-cheerios-effect.html>

[https://www.utwente.nl/en/news/!/2016/6/68739/cereal-science-the-inverted-](https://www.utwente.nl/en/news/!/2016/6/68739/cereal-science-the-inverted-cheerios-effect)

[cheerios-effect](https://www.utwente.nl/en/news/!/2016/6/68739/cereal-science-the-inverted-cheerios-effect)

<https://www.sciencedaily.com/releases/2016/06/160613153400.htm>
http://www.eurekalert.org/pub_releases/2016-06/qmuo-csh060916.php
http://enme.umd.edu/news/news_story.php?id=9744
<http://www.qmul.ac.uk/media/news/items/se/177892.html>
http://www.spacedaily.com/reports/Cereal_science_How_scientists_inverted_the_Cheerios_effect_999.html
<http://eoswetenschap.eu/artikel/ontbijtonderzoek-het-omgekeerde-cheerios-effect>
(Dutch)
<http://www.scienceandtechnologyresearchnews.com/cereal-science-inverted-cheerios-effect/>

Shayandev Sinha's participation in ASME's Family Day in Washington DC
Year: 2016

http://www.enme.umd.edu/news/news_story.php?id=9657
https://www.asme.org/about-asme/news/asme-news/section-takes-part-family-day-2016-washington-dc?utm_source=newsletters&utm_medium=email&utm_campaign=032516_asme_news

Selection of Guang Chen as 2016 Clark School Future Faculty
Year: 2016

http://www.enme.umd.edu/news/news_story.php?id=9630

Paper on nanomanufacturing of metal chalcogenides published in Scientific Reports
Year: 2016

http://enme.umd.edu/news/news_story.php?id=9569

Selection of Shayandev Sinha to ASME's International Petroleum Technology Institute Collegiate Council
Year: 2016

http://www.enme.umd.edu/news/news_story.php?id=9500
http://eng.umd.edu/html/news/news_story.php?id=9500

Guang Chen's selection as a Northrop Grumman Graduate Fellow
Year: 2015

http://www.enme.umd.edu/news/news_story.php?id=9418

Paper on bacterial floc streamer published in Scientific Reports
Year: 2015

<https://uofa.ualberta.ca/news-and-events/newsarticles/2015/september/researchers-observe-bacteria-behaving-badly>

Paper on soft wetting dynamics published in Nature Communications
Year: 2015

http://enme.umd.edu/news/news_story.php?id=9187

http://eng.umd.edu/html/news/news_story.php?id=9187
<http://www.utwente.nl/en/news/!/2015/8/412911/surfing-droplets-in-nature-communications>
<http://phys.org/news/2015-08-movement-droplets-soft-surfaces.html>
<http://www.nanowerk.com/nanotechnology-news/newsid=40979.php>

Cover Article on Soft Particle Electrostatics in Colloids and Surfaces B: Biointerfaces

Year: 2015

http://www.enme.umd.edu/news/news_story.php?id=8958
http://eng.umd.edu/html/news/news_story.php?id=8958

Paper on Bacterial Biofilm Streamers published in Scientific Reports

Year: 2014

http://www.enme.umd.edu/news/news_story.php?id=8709

Cover Article on Drop Deposition published in Soft Matter

Year: 2013

<http://phys.org/news/2013-06-discovery-oil.html>
<http://www.redorbit.com/news/science/1112880889/glass-may-help-one-day-clean-up-oil-spills-062213/>
<http://www.mece.engineering.ualberta.ca/en/Research/Research/2013/August/Under-waterDropDepositionCoverArticleinSoftMatter.aspx>

Paper on Underwater Superoleophobicity published in Scientific Reports

Year: 2013

<http://phys.org/news/2013-06-discovery-oil.html>
<http://www.redorbit.com/news/science/1112880889/glass-may-help-one-day-clean-up-oil-spills-062213/>

Coverage on Banting Postdoctoral Fellowship

Year: 2012

<http://www.engineering.ualberta.ca/en/NewsEvents/Engineering%20News/2012/September/BantingFellowshipbolstersresearchprojects.aspx>

III. Teaching, Extension, Mentoring, and Advising

III.A. Courses Taught

Semester: Fall, 2019
Course: Fluid Mechanics (ENME 331)
Number of Students: 168
Number of Students who Responded: 55
Role: Instructor for Lectures
Score: 2.80

Semester: Fall, 2019
Course: GEMSTONE
Number of Students: 13
Number of Students who Responded: 7
Role: Mentor
Score: 3.2

Semester: Spring, 2019
Course: Fluid Mechanics (ENME 331)
Number of Students: 130
Role: Instructor for Lectures
Score: 3.33

Semester: Fall, 2018
Course: Fluid Mechanics (ENME 331)
Number of Students: 59
Role: Instructor for 2 Studio sections (ENME 331 0101 and ENME 331 0103)
Score: 3.27

Semester: Spring, 2018
Course: GEMSTONE Team Project (GEMS297)
Number of Students: 11
Role: Mentor
Score: 3.24

Semester: Spring, 2018
Course: Fluid Mechanics (ENME 331)
Number of Students: 122
Role: Instructor for Lectures
Score: 3.05

Semester: Fall, 2017
Course: ADV TOPIC MECH ENG (INTERFACIAL FLUID MECHANICS) (ENME 8081)
Number of Students: 9
Role: Instructor
Score: 3.4

Semester: Fall, 2017
Course: GEMSTONE Team Project (GEMS297)
Number of Students: 11
Role: Mentor
Score: 2.8

Semester: Spring, 2017
Course: GEMSTONE Team Project (GEMS297)
Number of Students: 10
Role: Mentor
Score: 2.98

Semester: Spring, 2017
Course: Fluid Mechanics (ENME 331)
Number of Students: 140
Role: Instructor for Lectures
Score: 2.94

Semester: Fall, 2016
Course: GEMSTONE Team Project (GEMS297)
Number of Students: 11
Role: Mentor
Score: 3.21

Semester: Fall, 2016
Course: Fluid Mechanics (ENME 331)
Number of Students: 60
Role: Instructor for 2 Studio sections
Score: 3.00

Semester: Spring, 2016
Course: GEMSTONE Team Project (GEMS297)
Number of Students: 11
Role: Mentor
Score: 3.28

Semester: Spring, 2016
Course: Fluid Mechanics (ENME 331)
Number of Students: 79
Role: Instructor for 3 Studio sections

Score: Not available as evaluation was not conducted by the Department

Semester: Fall, 2015

Course: Vibration, Controls and Optimization I (ENME 361)

Number of Students: 115

Role: Instructor

Score: 3.46

Semester: Spring, 2015

Course: Fluid Mechanics (ENME 331)

Number of Students: 46

Role: Instructor for 2 Studio sections

Score: 3.27

Semester: Fall, 2014

Course: Vibration, Controls and Optimization I (ENME 361)

Number of Students: 98

Role: Instructor

Score: 2.84

III.B. Teaching Innovations

III.B.1. Course or Curriculum Development

- Introduced a Research Project Option in the Studios Instructed for ENME 331 (Fall, 2016). In this project, two student groups were provided options to carry out research projects (instead of standard course project) under the mentorship of Dr. Das. The research findings from these two projects are being currently drafted up as two journal articles.
- Introduced a new graduate course title "INTERFACIAL FLUID MECHANICS" in Fall 2017 where the ideas of capillarity and surface tension driven fluid flows as well as flows in micro-nanosystems were taught.
- Introduced a mandatory research project on Aerosol Jet 3D Printing in ENME 331 for Spring 2018. The project was based on the recently published work (see journal paper #14 in section II.B.) of Dr. Das.

III.C. Advising: Research or Clinical

(Completed: 2 Postdoc, 3 PhD, 4 MS; Current: 2 Postdocs, 7 PhD, and 2 MS)

III.C.1. Undergraduate

1. **Name of the Student:** Vineet Padia
Period Involved: October, 2015 to April, 2016
Current Placement of the Student: Undergraduate student in the Department of Mechanical Engineering, UMD

2. **Name of the Student:** Lucas Myers
Period Involved: February 2015 to December, 2015
Current Placement of the Student: Undergraduate student in the Department of Mechanical Engineering, UMD
3. **Name of the Student:** Kyeong Il Bae
Period Involved: June 2015 to August, 2015
Current Placement of the Student: Undergraduate student in the Department of Mechanical Engineering, UMD
4. **Name of the Student:** Joseph Andrews
Period Involved: July 2014 to June, 2015
Current Placement of the Student: Completed MS under the supervision of Dr. Das; currently employed as *Radar Systems Engineer* in *Technology Service Corporation, Silver Spring, MD*
5. **Name of the Student:** Kyle McDaniel
Period Involved: June, 2014 to May, 2015
Current Placement of the Student: Employee in *MEP Engineering Design Firm, Catonsville, MD.*
6. **Name of the Student:** Fedra Valcius
Period Involved: June, 2014 to July, 2014
Other Information: Fedra was a student of Prince George's Community College when she summer interned in Dr. Das' group in UMD

III.C.2 Master's

Completed (**Role of Dr. Das:** MS Thesis Adviser)

1. **Name of the Student:** Neil Dalal
Period Involved: August, 2017 to November, 2018
Advisor: Abhijit Dasgupta, Professor, Department of Mechanical Engineering, University of Maryland
Co-Advisor: Siddhartha Das
Thesis Title: Influence of Gas Flow Rates on Trace Quality and Reliability in a Selected Conductor Ink Printed with an Aerosol Jet Printer
Current Placement of the Student: Applied Physics Laboratory, Johns Hopkins University
2. **Name of the Student:** Jahin Patwary
Period Involved: August, 2014 to August, 2018
Thesis Title: Energy Conversion in Nanochannels Grafted with Polyelectrolyte and Polyzwitterion Brushes
Current Placement of the Student: Industry

3. **Name of the Student:** Raja Sampath Maheedhara
Period Involved: March, 2017 to July, 2018
Thesis Title: Enhanced Diffusioosmosis and Thermoosmosis in Polyelectrolyte-brush-functionalized Nanochannels
Current Placement of the Student: Unknown

4. **Name of the Student:** Joseph Andrews
Period Involved: August, 2015 to August, 2016
Co-Adviser: Dr. Peter W. Chung, Associate Professor, Department of Mechanical Engineering, University of Maryland
Thesis Title: *Wetting of Graphene*
Current Placement of the Student: Employed as *Radar Systems Engineer* in *Technology Service Corporation, Silver Spring, MD*

Completed (Role of Dr. Das: Thesis Advisory Committee Member)

1. **Name of the Student:** Harshil Nagda
Defense Date: August, 2018
Advisor: Dr. Jelena Srebric, Professor, Department of Mechanical Engineering, University of Maryland
Thesis Title: A Methodology to Estimate Retrofit Energy Savings Using A Reduced-Order Energy Modeling Approach

2. **Name of the Student:** Jason Christopher Thompson
Defense Date: November, 2015
Advisor: Dr. Jungho Kim, Professor, Department of Mechanical Engineering, University of Maryland
Thesis Title: A study on critical heat flux mechanisms and the transition to film boiling

3. **Name of the Student:** Ning Yang
Defense Date: May, 2015
Advisor: Dr. Michael Ohadi, Professor, Department of Mechanical Engineering, University of Maryland
Thesis Title: Separation of fine liquid droplets from high speed air utilizing the electrodynamic technique

Ongoing (Role of Dr. Das: MS Thesis Adviser)

1. **Name of the Student:** Vishal Sankar Sivasankar
Period Involved: January 2019 to Present

2. **Name of the Student:** Bhargav Sai Chava

Period Involved: August, 2018 onwards

Transferred to PhD under Dr. Das (**Role of Dr. Das:** MS Thesis Adviser)

1. **Name of the Student:** Harnoor Singh Sachar
Period Involved: August, 2017 to July, 2018
Current Placement of the Student: PhD under Dr. Siddhartha Das
2. **Name of the Student:** Haoyuan Jing
Period Involved: August, 2015 to December, 2016
Current Placement of the Student: PhD under Dr. Siddhartha Das
3. **Name of the Student:** Parth Desai
Period Involved: August 2015 to December, 2016
Current Placement of the Student: PhD under Dr. Siddhartha Das

III.C.3. Doctoral

Completed (**Role of Dr. Das:** PhD Thesis Adviser)

1. **Name of the Student:** Yanbin Wang
Period Involved: August, 2016 to November, 2019
Thesis Title:
Current Placement of the Student: *Water, Ion, and Graphene: An Odyssey through the Molecular Simulations*
- 2, **Name of the Student:** Shayandev Sinha
Period Involved: January, 2015 to July, 2018
Thesis Title: *Bilayer Membrane Electrostatics and charge-regulated membrane-nanoparticle interactions*
First Placement of the Student after leaving the group: Employed as a Postdoc at Harvard University and Harvard Medical School (Postdoctoral Advisers: Dr. Nate Cira and Dr. Prof. Hyungsoon Im)
Current Placement of the Student (if known): Scientist, Intel Corporation
3. **Name of the Student:** Guang Chen
Period Involved: August, 2014 to January, 2017
Thesis Title: *Nanoconfined Polyelectrolyte Brushes: Thermodynamics, Electrostatics and Transport*
First Placement of the Student after leaving the group: Employed as a Postdoc at Princeton University working with Prof. Howard Stone
Current Placement of the Student after leaving the group: Employed as a Postdoc at Princeton University working with Prof. Howard Stone

Completed (Role of Dr. Das: Thesis Advisory Committee Member)

1. **Name of the Student:** Abraham S. Chen
Defense Date: December, 2018
Advisor: Prof. Sarah Bergbreiter, Associate Professor, Department of Mechanical Engineering, University of Maryland
Thesis Title: Characterizing the Combined Effect of Electrostatics and Polymer Adhesion for Elastomer-based Electroadhesives
2. **Name of the Student:** David C. Deisenroth
Proposal Date: November, 2018
Advisor: Prof. Michael Ohadi, Professor, Department of Mechanical Engineering, University of Maryland
Co-Advisor: Prof. Avram Bar-Cohen, Professor, Department of Mechanical Engineering, University of Maryland
Thesis Title: Two-Phase Flow Regimes and Heat Transfer in a Manifolded-Microgap
3. **Name of the Student:** Stefan Bangerth
Proposal Date: July, 2018
Advisor: Prof. Michael Ohadi, Professor, Department of Mechanical Engineering, University of Maryland
Thesis Title: Compact Absorber for Advanced Absorption Heat Pumps
4. **Name of the Student:** Mohamed Raafat
Defense Date: August, 2017
Advisor: Dr. Amr Baz, Professor, Department of Mechanical Engineering, University of Maryland
Thesis Title: Static and Dynamic Analysis of Periodic Tensegrity Structures
5. **Name of the Student:** Hajid Alsupie
Defense Date: August, 2016
Advisor: Dr. Amr Baz, Professor, Department of Mechanical Engineering, University of Maryland
Thesis Title: Vibration of Periodic Drillstrings with Local Sources of Resonance
6. **Name of the Student:** Ratnesh Tiwary
Defense Date: January, 2015
Advisor: Dr. Michael Ohadi, Professor, Department of Mechanical Engineering, University of Maryland
Thesis Title: Process intensification by utilizing multistage manifold microchannel heat and mass exchangers

Ongoing (Role of Dr. Das: PhD Thesis Advisor)

1. **Name of the Student:** Ankit Sai Etha
Period Involved: January 2019 to Present
2. **Name of the Student:** Turash Haque Pial
Period Involved: January 2019 to Present
3. **Name of the Student:** Beihan Zhao
Period Involved: January 2019 to Present
Co-Advisor: Abhijit Dasgupta Professor, Department of Mechanical and Engineering, University of Maryland
4. **Name of the Student:** Harnoor Singh Sachar
Period Involved: August, 2018 to Present
5. **Name of the Student:** Haoyuan Jing
Period Involved: January, 2017 to Present
6. **Name of the Student:** Parth Desai
Period Involved: January, 2017 to Present
7. **Name of the Student:** Jaemi Herzberger
Period Involved: November, 2014 to Present
Advisor: Dr. Abhijit Dasgupta, Professor, Department of Mechanical and Engineering, University of Maryland
Co-Advisor: Siddhartha Das

III.C.4. Post-doctoral

Completed

1. **Name of the Postdoc:** Yuan Gu
Period Involved: October, 2016 to November, 2018
Research Area: 3D-printed electronics
Current Placement of the Student: Industry (Electronic Ink)
2. **Name of the Postdoc:** Guang Chen
Period Involved: March, 2017 to February 2018
Research Area: Numerical modeling of 3D printing
Current Placement of the Student: Employed as a Postdoc at Princeton University working with Prof. Howard Stone

Ongoing

1. **Name of the Postdoc:** Enrique Wagemann
Period Involved: March, 2019 to Present
Research Area: Molecular Dynamics Simulations for Water-2D-material

Interactions

Other Information: Enrique is based in the University of Waterloo in the group of Prof. Sushanta K. Mitra and is being jointly advised by Prof. Mitra and Prof. Siddhartha Das.

2. **Name of the Postdoc:** Chenglin Yi
Period Involved: December, 2018 to Present
Research Area: 3D-printed electronics

III.C.5. Other Directed Research (e.g. K-12 Interactions)

- Mentored four high school students on the project “Understanding the science of superhydrophobic surfaces” as a part of the ESTEEM/SER-Quest Summer Program of the Center for Minorities in Science and Engineering, University of Maryland, College Park (July, 2016).
- Mentored five high school students on the project “Understanding the science of superhydrophobic surfaces” as a part of the ESTEEM/SER-Quest Summer Program of the Center for Minorities in Science and Engineering, University of Maryland, College Park (July, 2015).
- Mentored five high school students on the project “Surface Tension and Soft Matter: Surfactant-rich drops in Cassie-Baxter state” as a part of the ESTEEM/SER-Quest Summer Program of the Center for Minorities in Science and Engineering, University of Maryland, College Park (July, 2014).

III.D. Mentorship

III.D.1. Other

- Served as a GEMSTONE team mentor for the Team BACTERIA from Spring 2016 to Spring 2018.
- Serving as a GEMSTONE team mentor for the Team GECKO from Fall 2019 onwards

IV. Service and Outreach

IV.A. Editorships, Editorial Boards, and Reviewing Activities

IV.A.1. Editorial Boards

(Numbers inside the bracket refer to the total number of papers to which Dr. Das served as the editor)

Scientific Reports (Fluids and Plasma Physics Category; January, 2017 to Present) (4)

IV.A.2. Reviewing Activities for Journals

Served as Reviewer to Articles submitted to the Following Journals (Numbers inside the bracket refer to the total number of papers reviewed for the journal)

1. Science (1)
2. Nature Communication (1)
3. Advanced Materials (2)
4. ACS Applied Materials and Interfaces (1)
5. Macromolecules (2)
6. ACS Nano (1)
7. The Journal of Physical Chemistry Letters (1)
8. The Journal of Physical Chemistry (4)
9. Electrophoresis (5)
10. Soft Matter (5)
11. Scientific Reports (8)
12. Additive Manufacturing (1)
13. Microfluidics and Nanofluidics (8)
14. Colloids and Surfaces B (1)
15. Colloids and Surfaces A
16. Journal of Fluid Mechanics (6)
17. Chemical Engineering Science (1)
18. Microvascular Research (1)
19. Physics of Fluids (2)
20. Langmuir (5)
21. AIP Advances (1)
22. ASME Journal of Fluids Engineering (5)
23. ASME Journal of Heat Transfer (3)
24. Physical Review E (9)
25. Proceedings of the Royal Society A (1)
26. Industrial and Engineering Chemistry Research (1)
27. Nano Letters (1)
28. Physical Review Fluids (1)
29. RSC Advances (1)
30. Physical Chemistry Chemical Physics (2)
31. Soil Science Society of America Journal (1)

IV.A.3. Reviewing Activities for Agencies and Foundations

Served as Reviewer to proposals submitted to the following agency/foundation (*Numbers inside the bracket refer to the total number of proposals from the agency/foundation reviewed*)

1. National Science Foundation (7)
2. Department of Energy - Office of Science (3)
3. NextFlex (America's Flexible Hybrid Electronics Manufacturing Institute) (3)

IV.B. Committees, Professional & Campus Service

IV.B.1. Campus Service – Department

1. Served as the Chair of the PhD thesis defense committee of Mr. Yanbin Wang (November, 2019).
2. Served as the member of the Qualifying examination committee of Mr. Beihan Zhao (October, 2019).
3. Served as the member of the Productivity Committee (Fall, 2016 to Fall 2017).
4. Serving as the member of the Faculty Advisory Committee (Fall, 2015 to Fall 2017).
5. Served as the member of the Qualifying examination of Mr. Dong-Hyun Cho (October, 2018).
6. Served as the member of the PhD thesis defense committee of Mr. Abraham S. Chen (December, 2018).
7. Served as the member of the PhD thesis defense committee of Mr. David C. Deisenroth (November, 2018).
8. Served as the member of the MS thesis defense committee of Mr. Neil Dalal (November, 2018)
9. Served as the Chair of the MS thesis defense committee of Mr. Jahin Patwary (August, 2018).
10. Served as the member of the PhD thesis defense committee of Mr. Stefan Bangerth (July, 2018).
11. Served as the Chair of the PhD thesis defense committee of Mr. Shayandev Sinha (May, 2018).
12. Served as the Chair of the MS thesis defense committee of Mr. Raja Maheedhara (May, 2018).
13. Served as the member of the Qualifying examination of Mr. Rui Xu (October, 2017).
14. Served as the member of the PhD thesis defense committee of Mr. Mohamed Raafat (July, 2017)
15. Served as the member of the Qualifying examination of Mr. David Catalini (March, 2017).
16. Served as the member of the Qualifying examination of Mr. Yanbin Wang (March, 2017).
17. Served as the member of the Qualifying examination of Mr. Hoayuan Jing (March, 2017).
18. Served as the member of the Qualifying examination of Mr. Parth Rakesh Desai (March, 2017).

19. Served as the member of the Qualifying examination of Mr. Francis G. Vangessel (March, 2017).
20. Served as the Chair of the PhD thesis defense committee of Ms. Guang Chen (December, 2016).
21. Served as the member of the Qualifying examination of Mr. Daniel Bae (November, 2016).
22. Served as the member of the PhD thesis defense committee of Mr. Hajid Alsupie (August, 2016).
23. Served as the Chair of the MS thesis defense committee of Mr. Joseph Andrews (August, 2016).
24. Served as the member of the PhD Dissertation Proposal committee of Mr. Mohamed Rafaat (June, 2016).
25. Served as the member of the PhD Dissertation Proposal committee of Mr. Hajid Alsupie (February, 2016).
26. Served as the Chair of the Dissertation Proposal committee of Ms. Guang Chen (February, 2016).
27. Served as the member of the MS thesis defense committee of Mr. Jason Christopher Thompson (November, 2015).
28. Served as the member of the Qualifying examination of Mr. Stefan Bangerth (November, 2015). Served as the member of the Qualifying examination committee of Mr. Johnny Russo (October, 2015).
29. Served as the member of the Qualifying examination committee of Mr. Shayandev Sinha (October, 2015).
30. Served as the member of the MS thesis defense committee of Mr. Ning Yang (June, 2015).
31. Served as the member of the PhD Dissertation Proposal committee of Ms. Jaemi Herzberger (May, 2015).
32. Served as the member of the Qualifying examination committee of Mr. Shing Shin (March, 2015).
33. Served as the member of the Qualifying examination committee of Ms. Guang Chen (March, 2015).
34. Served as the member of the PhD thesis defense committee of Mr. Ratnesh Tiwary (January, 2015).
35. Served as the member of the Qualifying examination committee of Mr. Jason Robert Nixon (October, 2014).

IV.B.2. Leadership Roles in Meetings and Conferences

1. Co-Chair of the Session at the Symposium titled “BM03: Multi-scale Modeling of Soft-Materials and Interfaces” (Morning session, November 29, 2018) in 2018 Materials Research Society Fall Meeting and Exhibit, November 25 – November 30, 2018, Boston, MA.
2. Co-Chair of the Session at the Symposium titled “BM03: Multi-scale Modeling of Soft-Materials and Interfaces” (Afternoon session, November 26, 2018) in 2018

Materials Research Society Fall Meeting and Exhibit, November 25 – November 30, 2018, Boston, MA.

3. Co-organizer of the 19th Mid-Atlantic Soft Matter (MASM) Workshop held on February 2, 2018, College Park, MD.
4. Chair of the Session titled “Drops, Bubbles and Interfaces I” in APS March Meeting, March 13–17, 2017, New Orleans, LA.
5. Track Co-Chair for the track “Mechanics of Biological and Soft Materials” in Society of Engineering Science, 53rd Annual Technical Meeting, College Park, MD, October 4-7, 2016.
6. Chair of the Session titled “Drops, Bubbles and Interfacial Fluid Mechanics” in APS March Meeting, March 14–18, 2016, Baltimore, MD.
7. Chair of the Session titled “Soft Electrokinetics—Applications and Fundamentals” as a part of the Symposium “Wetting and Soft Electrokinetics” in 2015 Materials Research Society Fall Meeting and Exhibit, Boston, MA, November 29 - December 4, 2015.
8. Chair of the Session titled “Drops XII: Elastic Surfaces and Fibers” in 66th Annual Meeting of the APS Division of Fluid Dynamics, Pittsburgh, PA, November 24–26, 2013.
9. Co-Chair of the Special Track titled “Interfacial Tension, Capillarity, Surface Forces”, as a part of the 19th International Symposium on Surfactants in Solution (SIS2012), University of Alberta, Canada, June 24-28, 2012.