King Abdullah University of Science and Technology (KAUST)
Environmental Science and Engineering Program & Water Desalination and Reuse Center
Biological and Environmental Science and Engineering Division
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HIMANSHU MISHRA

SUMMARY

I develop and apply experimental methods to interrogate physical and chemical phenomena at water's interfaces with hydrophobic media; then, I translate scientific insights into sustainable technologies for global food–water–climate security such as SandX and CarboSoil. My research program at KAUST has garnered ~US$ 3M in competitive funding and produced 33 papers, 9 invention disclosures, and 1 start-up.

RESEARCH INTERESTS

- Bio-inspired technologies for water–food–climate–energy security and tech scale-up
- Tech for boosting soil-fertility, water-use efficiency, & soil carbon sequestration
- Marine insects (e.g., *Halobates*) and bio-mimicking coatings & packaging tech
- Chemical transformations at water–hydrophobe interfaces
- Nanoconfined liquids: surface forces, refractive indices, and dielectric constants
- Zwitterions and osmolytes in water (dilute and concentrated solutions)

WORK HISTORY

ASSOCIATE PROFESSOR OF ENVIRONMENTAL SCIENCE AND ENGINEERING & PRINCIPAL INVESTIGATOR AT WATER DESALINATION AND REUSE CENTER, KAUST

ASSOCIATE FACULTY, CENTER FOR DESERT AGRICULTURE, KAUST (OCTOBER 2022 -)

Jul 2020 - Present

ASSISTANT PROFESSOR OF ENVIRONMENTAL SCIENCE AND ENGINEERING & PRINCIPAL INVESTIGATOR AT WATER DESALINATION AND REUSE CENTER, KAUST

Nov 2014 – Jul 2020

ELINGS PRIZE POSTDOCTORAL FELLOW, CALIFORNIA NANOSYSTEMS INSTITUTE, UNIVERSITY OF CALIFORNIA SANTA BARBARA

Mentor: Late Prof. Jacob Israelachvili

Jul 2013 – Nov 2014

EDUCATION

PHD, CALIFORNIA INSTITUTE OF TECHNOLOGY, DEPARTMENT OF APPLIED PHYSICS & MATERIALS SCIENCE (2009-2013)

Advisors: William A. Goddard III and Michael R. Hoffmann

Thesis: Proton Transfers at the Air-Water Interface

MS, CALIFORNIA INSTITUTE OF TECHNOLOGY, DEPARTMENT OF APPLIED PHYSICS & MATERIALS SCIENCE (2008-2009)

MS, PURDUE UNIVERSITY, SCHOOL OF MECHANICAL ENGINEERING (2005-2007)

Advisors: Timothy S. Fisher and Timothy D. Sands

Thesis: Carbon Nanotube Electrical Interfaces for Thermoelectrics

BTECH, MECHANICAL ENGINEERING, PUNJAB ENGINEERING COLLEGE, CHANDIGARH (2001-2005)

PEER-REVIEWED JOURNAL ARTICLES

(Google Scholar citations: 1484, *h*-index: 22, i10-index: 30)

1. Gallo Jr., Musskopf, N. H., Liu, X., Zhang, Z., Petry, J., Zhang, P., Thoroddsen, S., Im, H., **Mishra, H.***, "On the Formation of Hydrogen Peroxide in Water Microdroplets", ***Chemical Science***, 2022, 13, 2574–2583 **(Journal Cover; Interview in Royal Society of Chemistry's *Chemistry World and ACS Chemical & Engineering News*)**
2. Gallo Jr., A., Odokonyero, Mousa, M. A., A., Reihmer, J., Morton, M. J. L., Al-Mashharawi, S., R. Marasco, Daffonchio, D., McCabe, M. F., Tester, M., **Mishra, H***, "Nature-Inspired Superhydrophobic Sand Mulches Increase Agricultural Productivity and Water-Use Efficiency in Arid Regions" ***ACS Agricultural Science & Technology*****,** 2022, 2, 2, 276–288 (DOI:10.1021/acsagscitech.1c00148) **(Journal Cover & ACS Weekly PressPac: March 16, 2022)**
3. Ali, M., Hong, P., **Mishra, H.**, Vrouwenwelder, Saikaly, P., "Adopting Circular Model: Opportunities and Challenges for Transforming Wastewater Treatment Plants into Resource Recovery Facilities in Saudi Arabia", ***Water Reuse*** (just accepted)
4. Yang, Z., Zhang, P., Shi, M., Julaih, A., **Mishra, H.**, Fabrizio E., Thoroddsen, S., "Direct Imaging of Polymer Filaments Pulled from Rebounding Drops", ***Soft Matter***, 2022, DOI: 10.1039/D2SM00599A
5. Odokonyero, K., Gallo Jr., A., **Mishra, H***, "Effects of Superhydrophobic Sand Mulching on Evapotranspiration and Phenotypic Responses in Tomato (*Solanium lycopersicum*) Plants Under Normal and Reduced Irrigation", ***Plant-Environment Interactions***, 2022, Vol. 3, Issue 2, 74–88 (DOI: 10.1002/pei3.10074) **(Cover)**
6. Cheng, L., **Mishra H.***, "Why did only one genus of insects, *Halobates*, take to the high seas?" **Invited review article**, ***PLoS Biology***, 2022, 20(4): e3001570 (https://doi.org/10.1371/journal.pbio.3001570)
7. Ridwan, M. G., Shrestha, B. R., Maharjan, N., **Mishra, H.***, "Zwitterions layer but do not screen electrified interfaces in dilute solutions", ***Journal of Physical Chemistry B***, 2022 (DOI:10.1021/acs.jpcb.1c10388) **(Journal Cover)**
8. Shi, M., Das, R., Arunachalam, S., **Mishra, H.***, "Suppression of Leidenfrost Effect on Superhydrophobic Surfaces", ***Physics of Fluids***, 2021, 33, 122104,
9. Musskopf, N., Gallo Jr., Zhang, P., **Mishra, H.***, "The Air–Water Interface of Condensed Water Microdroplets does not Produce H_2O_2", ***Journal of Physical Chemistry Letters***, 2021, 12, 46, 11422–29 **(Journal Cover)**

10. Gallo Jr., A., Tavares, F., Das, R., **Mishra, H.***, "How Particle–Particle and Liquid–Particle Interactions Govern the Fate of Evaporating Liquid Marbles", ***Soft Matter***, 2021, 17, 7628 – 7644, DOI: 10.1039/D1SM00750E **(Journal Cover)**
11. Odokonyero, K., Gallo Jr., A., **Mishra, H***, "Nature-inspired Wax-coated Jute Bags for Reducing Post-Harvest Storage Losses", ***Scientific Reports***, 2021, 11, 15354
12. Nauruzbayeva, J., Sun, Z., Gallo Jr., A., Ibrahim, M., Santamarina, J. C., **Mishra, H.***, "Electrification at Water-Hydrophobe Interfaces", ***Nature Communications***, 2020, 11, 5285, DOI: 10.1038/s41467-020-19054-8 **(Editors' Highlights)**
13. Santana, A., Farinha, A. S. F., Torano, A. Z., Ibrahim, M., **Mishra, H***, "First-principles Based Rationally Designed Materials for treating Wastewaters", ***International Journal of Quantum Chemistry***, 2021, 121: e26501 **(Journal Cover)**
14. Arunachalam, S., Ahmad, Z., Das, R., **Mishra, H.***, "Counterintuitive Wetting Transitions in Doubly Reentrant Cavities as a Function of Surface Make-up, Hydrostatic Pressure, and Cavity Aspect Ratio", ***Advanced Materials Interfaces***, 2020, 7, 2001268. DOI:10.1002/admi.202001268 **(Journal Cover)**
15. Das, R., Ahmad, A., Nauruzbayeva, **Mishra, H.***, "Biomimetic Coating-free Superomniphobicity", ***Scientific Reports***, 2020, 10, Article number: 7934 **(Top 100 *Scientific Reports* chemistry papers in 2020)**
16. Mahadik, G. A., Hernandez Sanchez, J. F., Arunachalam, S., Gallo Jr., A., Farinha, A. S., Thoroddsen, S. T., **Mishra, H.***, Duarte, C. M., "Superhydrophobicity and size reduction enabled Halobates (Insecta: Heteroptera, Gerridae) to colonize the open ocean", ***Scientific Reports***, 2020, 10, Article number: 7785
17. Pillai, S., Santana, A., Das, R., Shrestha, B.R., Manalastas, E., **Mishra, H*,** "A Molecular to Macro Level Assessment of Direct Contact Membrane Distillation for Separating Organics from Water", ***Journal of Membrane Science***, 2020, Vol. 608, 118140
18. Gonzalez-Avila, S. R., Nguyen, D. M., Arunachalam, S., Domingues, E., **Mishra, H.***, Ohl, C-D., "Mitigating Cavitation Erosion Using Biomimetic Gas-Entrapping Microtextured Surfaces (GEMS)", ***Science Advances***, 2020, Vol. 6, No. 13, eaax6192
19. Das, R., Arunachalam, S., Ahmad, Z., Manalastas, E., Syed, A., Buttner, U., **Mishra, H.*,** "Proof-of-Concept for Gas-Entrapping Membranes (GEMs) Derived from Water-loving SiO2/Si/SiO2 Wafers for Green Desalination", ***Journal of Visualized Experiments***, 2020, Issue 157, e60583 (doi:10.3791/60583)
20. Shrestha, B. R., Pillai, S., Santana, A., Donaldson, Jr., S. H., Pascal, T. A., **Mishra, H.***, "Nuclear Quantum Effects in Hydrophobic Nanoconfinement", ***Journal of Physical Chemistry Letters,*** 2019, 10, 5530-5535 **(Journal cover)**
21. Arunachalam, S., Domingues, E. M., Das. R., Nauruzbayeva, J., Buttner, U., Syed, A., **Mishra, H.***, "Rendering SiO2/Si surfaces omniphobic by carving gas-entrapping microtextures comprising reentrant and doubly reentrant cavities or pillars", ***Journal of Visualized Experiments***, 2020, 156, e60403, (DOI:10.3791/60403)
22. Gallo Jr., A., Farinha, A. S., Emwas, A-H., Santana, A., Nielsen, R. J., Goddard III, W. A., **Mishra, H.***, "Reply to the 'Comment on "The chemical reactions in

electrosprays of water do not always correspond to those at the pristine air–water interface", by A. J. Colussi and S. Enami", ***Chemical Science,*** 2019, 10

23. Das, R., Arunachalam, S., Ahmad, Z., Manalastas, E., **Mishra, H.***, "Bio-inspired Gas-entrapping Membranes (GEMs) Derived from Common Water-wet Materials for Green Desalination", ***Journal of Membrane Science***, 2019, Vol 588, 117185
24. Gallo Jr., A., Farinha, A. S., Dinis, M., Emwas, A-H., Santana, A., Nielsen, S., Goddard III, W. A., **Mishra, H.***, "The Chemical Reactions in Electrosprays of Water Do Not Always Correspond to Those at the Pristine Air-Water Interface", ***Chemical Science,*** 2019, 10, 2566-2577 **(Journal cover)**
25. Subramanian, N., Al-Saadi, A., Qamar, A., Gallo Jr., A., Ridwan, M. G., Lee, J-G., Pillai, S., Anjum, D., Ghaffour, N., Sharipov, F., **Mishra, H.***, "Evaluating the Potential of Superhydrophobic Nanoporous Alumina Membranes for Direct Contact Membrane Distillation", ***Journal of Colloid and Interface Science,*** 2019, 533(1), 723-732
26. Arunachalam, S., Das, R., Nauruzbayeva, Domingues, E. M., **Mishra, H.***, "Assessing Omniphobicity by Immersion", ***Journal of Colloid and Interface Science,*** 2019, Vol. 534, 156-162
27. Domingues, E. M., Arunachalam, S., Nauruzbayeva, **Mishra, H.***, "Biomimetic Coating-free Surfaces for Long-term Entrapment of Air under Wetting Liquids", ***Nature Communications,*** 2018, 9, Article Number: 3606.
28. Bera, B., Shahidzadeh, N., **Mishra, H.,** Bonn D., "Wettability of Water on Graphene Nanopowders of Different Thicknesses", ***Applied Physics Letters*** 2018, 112, 151606
29. Domingues, E. M., Arunachalam, S., **Mishra, H.*,** "Doubly Reentrant Cavities Prevent Catastrophic Wetting Transitions on Intrinsically Wetting Surfaces", ***ACS Applied Materials & Interfaces,*** 2017, 9, 21532-38
30. Yutkin, M. P., Lee, J. Y., **Mishra, H.,** Patzek, T. W., Radke, C. J., "Bulk and Surface Aqueous Speciation of Calcite: Implications for Low-Salinity Waterflooding of Carbonate Reservoirs", ***Society of Petroleum Engineers Journal,*** 2017, Vol 23(1), pp 84-101
31. Kaufman, Y., Chen, S-Y., **Mishra, H.**, Schrader, A. M., Lee, D. W., Das, S., Donaldson Jr., S. H., Israelachvili, J. N., "Simple to Apply Wetting Model to Predict Thermodynamically Stable and Metastable Contact Angles on Textured/Rough/Patterned Surfaces", ***Journal of Physical Chemistry C,*** 2017, 121, 5642-56
32. **Mishra, H.*,** Schrader, A. M., Lee, D. W., Gallo Jr., A., Chen, S-Y., Kaufman, Y., Das, S., Israelachvili, J. N. "Time-Dependent Wetting Behavior of PDMS Surfaces with Bioinspired, Hierarchical Structures", ***ACS Applied Materials & Interfaces*** 2016, 8, 8168−8174 **(Journal cover)**

BEFORE JOINING KAUST

33. Colussi, A. Yabushita, S. Enami, Hoffmann, M. R., Liu, W. G., **H. Mishra**, W. A. Goddard III, "Tropospheric Aerosol as a reactive intermediate", ***Faraday Discussions,*** 2013, 165, 407-420
34. **H. Mishra**, S. Enami, L. A. Stewart, R. J. Nielsen, M. R. Hoffmann, W. A. Goddard III, A. J. Colussi, "Brønsted basicity of the air-water interface", ***Proceedings of the***

National Academy of Sciences, 2012, 109(46) 18679-18683 (Commentary: *Nature Chemistry*: *https://www.nature.com/articles/nchem.1556*)

35. **H. Mishra**, S. Enami, R. J. Nielsen, W. A. Goddard III, M.R. Hoffmann, A. J. Colussi, "Anions dramatically enhance proton transfer across aqueous interfaces", ***Proceedings of the National Academy of Sciences*****,** 2012, 109(26), 10228-10232
36. **H. Mishra**, R. J. Nielsen, S. Enami, M. R. Hoffmann, A. J. Colussi, W. A. Goddard III, "Quantum chemical insights into the dissociation of nitric acid on the surface of aqueous electrolytes", ***International Journal of Quantum Chemistry****,* 2012, *113(4) 413-417*
37. **H. Mishra**, C. J. Yu, D. P. Chen, W.A. Goddard III, N. F. Dalleska, M. R. Hoffmann, M. S. Diallo, "Branched polymer resins with high binding capacity and selectivity for boron in aqueous solutions", ***Environmental Science & Technology****,* 2012, 46(16), 8998-9004
38. S. Enami, **H. Mishra**, M. R. Hoffmann, A. J. Colussi, "Dry deposition and oligomerization of gaseous isoprene on mildly acidic surfaces", ***Journal of Physical Chemistry A*****,** 2012, 116 (24), 6027-6032
39. S. Enami, **H. Mishra**, M. R. Hoffmann, A. J. Colussi, "Hofmeister effects in micromolar electrolyte solutions", ***Journal of Chemical Physics***, 2012, 136(15), 154707 (pg 1-7)
40. G. Acharya, S. C. Shin, M. McDermott, **H. Mishra**, H. Park, I. C. Kwon, K. Park, "The hydrogel template method for fabrication of homogeneous nano/micro particles", ***Journal of Controlled Release***, 2010, 141(3): 314-9
41. **H. Mishra**, B. A. Cola, V. Rawat, P. B. Amama, K. G. Biswas, X. Xu, T. S. Fisher, T. D. Sands, "Bismuth telluride films electrodeposited onto carbon nanotube arrays for mechanically compliant, low resistance interfaces in thermoelectric microdevices", ***Advanced Materials****,* 2009, 21, 1-4
42. **H. Mishra**, S. Mukherjee, "Examining the best-fit paradigm for FEM at element level", ***Sadhāna - Journal of Engineering***, 2004, 29(6), 1-16 (published by the Indian Academy of Sciences)

ARTICLES UNDER REVIEW

43. Hong, P.*, **Mishra, H.**, Daffonchio, D., McCabe, M. F., "Roadmap Towards Achieving Sustainable Greening", (under review, ***Nature Water***)

ARTICLES UNDER PREPARATION

44. Arunachalam, S., **Mishra, H.***, "Breathing Interfaces" (under preparation)
45. Arunachalam, S., **Mishra, H.***, "Directional Diffusion" (under preparation)
46. Eatoo, M., Zhang, P., **Mishra, H.***, "How Metal Nanoparticles Form in Sprayed Water Microdroplets" (under preparation)
47. Sadullah, M., Arunachalam, S., **Mishra, H.*** "Liquid–Solid Work of Adhesion" (under preparation)

48. Zhang, P., **Mishra, H.***, Liquid Marbles for Sensing Interfacial Reactions, (under preparation)
49. Arunachalam, S., Qamar, A., Das, R., **Mishra, H.***, "Zipper Cavities" (under preparation)
50. Odokonyero, K., Arunachalam, S., Gallo Jr., Ibrahim, M., Jaleel, N. M. A., **Mishra, H***, "Jute Mulches" (under preparation)
51. Ahmad, Z., Qamar, A., Das, R., Arunachalam, S., **Mishra, H.***, "Breaking through Gas-entrapping Microtextured Surfaces (GEMS)" (under preparation)
52. Ahmad, Z., Das, R., **Mishra, H.***, "Coating-free and Scalable Gas-Entrapping Membranes (GEMs)" (under preparation)
53. Zhang, P., Heuberger, M., Mishra, H.* "Muscovite Mica Refractive Indices" (under preparation)
54. Al-Zubi, Gallo Jr., A., Dos-Santos, V., Odokonyero, K., Taief, W., **Mishra, H.***, "Probing Water Mass Transfer Across Sandy Soils Mulched with Superhydrophobic Sand Mulches" (under preparation)

INTELLECTUAL PROPERTY

1. Mishra, H., Gallo Jr., A., Vernooij, B., Bubble-driven separating SandX–soil mixtures, **coming up**
2. Laurensen, K., Mishra, H., Overmans, S., Gallo Jr., A., Alkane-functionalized silica particles for terpenoid separation from engineered algae cultures, USPTO Provisional patent filed (Aug 30, 2022)
3. Mishra, H. and Shi, M., "Coating-free superomniphobic surfaces for drag reduction in thermal machinery without compromising heat transfer", USPTO Application 63/141,101 | filed on Jan 2, 2021
4. Mishra, H. and Odokonyero, K., "Wax-coated jute fabrics and their applications", USPTO Application # 63/141,104 | filed on January 26th, 2021|WO Application No. PCT/IB2022/050592
5. Mishra, H., Ahmad, Z., Manalastas, "A device for applying pressure during confocal microscopy", KAUST TTO, October 7, 2019
6. Ohl, C-D., Mishra, H., Gonzalez, R., Ngugen, M. "Surface protection against cavitation erosion" European Patent Application EP 0752-5518, March 7th, 2019; USPTO US 2022/0177094 A1, June 9, 2022.
7. Mishra, H., Arunachalam, S., Domingues, E., Das, R., "Perfluorocrbon-free membranes for membrane distillation" (USPTO Application # 17/056,809) May, 2018
8. Mishra, H., Subramanian, N. "Iridium Oxide Microelectrodes for Sensing Moisture and Humid Fumes of Acids and Bases", USPTO Application # PCT/IB2017/057502 | filed in Dec, 2016.
9. Mishra, H., Reihmer, J., Gallo Jr., A. "Compositions and Methods Relating to Functionalized Sands" (USPTO #11497177, Issued on 11/15/2022) (https://patents.google.com/patent/WO2018091986A1/en)

10. Mishra, H., Farinha, A. S. F., and Sinha, S. "Functionalized SiO_2 Microspheres for Extracting Oil from Produced Water", (USPTO # PCT/IB2016/055358) Filed on September 9th, 2015 (https://patents.google.com/patent/WO2017042709A1/en)
11. Diallo, M. S., Yu, C. J., Mishra, H., "High Capacity Oxoanion Chelating Media from Hyperbranched Macromolecules", US Patent #20130118986 A1 https://patents.google.com/patent/WO2013103909A1/en

RESEARCH TRANSLATION

1. IP licensing and start-up incorporation underway in Saudi Arabia and the USA.
2. Delivering turn-key plantation projects in the MENA region, viz. materials, reactors, labor, & logistics. (Snippet on SandX: https://www.youtube.com/watch?v=R3EIB4hgB8E&t=15s)
3. On-going consultancy projects: (i) full service for planting 600 native trees on a desert site in Khurais for ARAMCO (US $32,453); (ii) Durrah Sugar factory – assessment of calcium-rich filter cake for soil amendment (SAR 20,000); (iii) Al Ajweed Farm (Riyadh); (iv) Wadi Qadid National Park with KAUST Center for Desert Agriculture and Saudi National Center for Vegetation Cover (NCVC) – testing of date palm biochar and SandX on 10,000 trees.

HONORS AND SCHOLARLY AWARDS

- US $0.72 M Research Translation Grant to scale-up our patented SandX technology and conduct industrial validation and testing with partners such as Aramco EPD (2022–2024)
- KAUST winner & finalist in Falling Walls Competition, Berlin (Batool Albar MS–PhD student, November 11th, 2022)
- Keynote Speaker, 5th Edition of Innovations in Food Science and Human Health, Barcelona (September 20–21, 2022)
- US $40,000 prize, Taqadam 2022 Start-up Accelerator Program (top 10 among >9000 applicants)
- Golden Jubilee Visiting Fellowship Endowment (2022), Institute of Chemical Engineering, Mumbai (Honorarium INR 5000; a public lecture)
- US $7,000 cash prize at KAUST's 2022 Winter Enrichment Program's Women to Impact Competition (2nd rank among 305 entries @worldwide), Title: SandX and BiocharX soil amendment technologies.
- Keynote Speaker, Elsevier's 11th Int'l Colloids Conference, Lisbon (June 12–15, 2022)
- Interviewed by the Royal Society of Chemistry magazine *Chemistry World*: https://www.chemistryworld.com/news/study-casts-doubt-on-water-microdroplets-ability-to-spontaneously-produce-hydrogen-peroxide/4015169.article
- Cover Article, ACS Agricultural Science & Technology, DOI:10.1021/acsagscitech.1c00148
  ACS Press Pac (Mar 16, 2022)
  https://www.acs.org/content/acs/en/pressroom/presspacs/2022/acs-presspac-march-16-2022/wax-coated-sand-keeps-soil-wet-longer-improves-crop-yields-in-arid-regions.html
- Cover Article, *Chemical Science* (2022) https://doi.org/10.1039/D1SC06465G
- Cover Article, *JPhysChemB* (2022) DOI:10.1021/acs.jpcb.1c10388
- Cover Article, *JPhysChemLetters* (2021) DOI: https://doi.org/10.1021/acs.jpclett.1c02953
- Cover Article, *Soft Matter* (2021), DOI: 10.1039/D1SM00750E
- Top 100 Scientific Reports chemistry papers in 2020, DOI: 10.1038/s41598-020-64345-1
- Editors' Highlights, *Nature Communications* (2020), DOI: 10.1038/s41467-020-19054-8

- Cover Article, *Advanced Materials Interfaces* (2020), DOI:10.1002/admi.202001268
- Cover Article, *International Journal of Quantum Chemistry* (2020) DOI:10.1002/qua.26501
- Student delegate to the 70th Lindau Nobel Laureate Interdisciplinary Meeting (2020 & 2021): Adair Gallo Jr., PhD student
- Invited lecture: Physical Chemistry Seminar, College of Chemistry, University of California Berkeley, CA, USA (October 15th, 2019)
- Invited lecture: Chemical Physics Seminar, Division of Chemistry and Chemical Engineering, California Institute of Technology, Pasadena, CA, USA (October 8th, 2019)
- Best Poster Prize, 45th International Conference on Micro and Nano Engineering, Rhodes, Greece (September 23-26, 2019) (Zain Ahmad, MS student) (Out of 404 entries; cash prize: 400 Euros)
- Session Chair, Wetting on Soft or Microtextured Surfaces, Bad Honnef, Germany (Host: Max Planck Institute for Polymer Research, Mainz, Apr 11-13, 2019)
- Cover Article, *Journal of Physical Chemistry Letters* (2019) DOI:10.1021/acs.jpclett.9b01835
- Cover Article, *Chemical Science* (2019) DOI: 10.1039/C8SC05538F
- Lecture at the United Nations COP-24 meeting on climate change at Katowice, Poland (Dec, 2018) got >92k views on Facebook through Institute of Sustainable Development (IISD) reporting.
- Elsevier Best Poster Award, 7th International Colloids Conference, Sitges-Barcelona, Spain (2017) (Three selected out of a pool of 277 entries)
- First Place, Doctoral Level Students Poster Contest, 5th Water Arabia Conference and Exhibition, Al Khobar, Saudi Arabia (2017) (Mr. Adair Gallo Jr., PhD student)
- Cover Article: *ACS Applied Materials & Interfaces* (2016) DOI: 10.1021/acsami.5b10721
- Elings Postdoctoral Fellowship, California NanoSystems Institute, University of California Santa Barbara (2013–2014): US$ 60,000/yr (for 3 yrs) + US$ 10,000 discretionary (Host: Jacob Israelachvili)
- Gilbert Ling Prize, 7th Conf. on the Physics, Chemistry and Biology of Water, VT (2012)
- The Young Investigator Award (50,000 Yen cash award) Seventh Congress of the International Society for Theoretical Chemical Physics, Tokyo (2011)
- Division Fellowship, California Institute of Technology (2008)

COMPETITITVE RESEARCH FUNDING

1. Development, Scale-up, and Industrial Validation of Soil Amendment Technologies for Enhanced Irrigation Efficiency in the Middle East and Beyond. **Principal Investigator: H. Mishra,** Research Translation Grant, Innovation and Economic Development, KAUST, (US$ 0.72 M; 2022-2024)
2. Scaling production of high value biochar: feedstock variability, material characterization, and field trials. Co-PIs: **Mishra, H.**, Sarathy, M., Grade, C., Laurensen, K., and Fatayer, S., KAUST Circular Carbon Initiative and Climate & Livability Initiative ($0.35 M; 2022-2024)

3. Exploring Nano-confined Liquids' Refractive Indices and Density Fluctuations via Multiple Beam Interferometry and First-Principles Calculations. Competitive Research Grant, Office of Sponsored Research, KAUST. **Principal Investigator: H. Mishra**; Co-PIs: Manfred Heuberger (Swiss Empa) and Tod Pascal (UC San Diego) (Under Review)
4. Exploring Red Sea *Halobates*. Competitive Research Grant, Office of Sponsored Research, KAUST. **Principal Investigator: H. Mishra**; Co-PI: Lanna Cheng (Scripps Institution of Oceanography), Daniele Daffonchio and Carlos Duarte (KAUST), Vassilious Roussis and Fay, ($400,000; 2022-2024)
5. Probing Membrane-Water Interfaces to Improve Water Purification Efficiency. KAUST's Center Partnership Fund Program 2019. Principal Investigator: Richard Saykally (University of California Berkeley); **Co-PI: H. Mishra** (US$ 125,000; 2019-2020)
6. Field Trials of Superhydrophobic Sand Mulches with Crops and Trees Towards Boosting Vegetation in Drylands. Office of Sponsored Research, KAUST. **Principal Investigator: H. Mishra**; Co-PI: Profs. Magdi Mousa & Adel Qurashi (KAU, Jeddah). ($590,999; 2018-2021).
7. Characterizing Condensation in Doubly Reentrant Cavity Microtextures using Neutron Imaging using DINGO. Australian Center for Neutron Scattering (ANSTO). **Principal Investigator: H. Mishra**; Co-PIs: Dr. Floriana Salvemini and Dr. Jitendra Mata, ANSTO. 2018 (Value: AU$ 37,600).
8. Exploring the Origins of Hydrophobic Interactions via a Complementary Experimental and Theoretical Approach. Competitive Research Grant, Office of Sponsored Research, KAUST. **Principal Investigator: H. Mishra**; Co-Principal Investigator: Tod Pascal (UC San Diego). 2018-2020 ($400,000).
9. Electronic Properties of Water near Large Extended Hydrophobic Interfaces. KAUST Supercomputing Laboratory Grant. **Principal Investigator: H. Mishra**; Co-Principal Investigator: Dr. Ali Hassanali, International Center for Theoretical Physics, Trieste, Italy. 2017-2019. (25 Million CPU hours)
10. Ion interactions with Membranes and Surfactants. KAUST Supercomputing Laboratory Grant. **Principal Investigator: H. Mishra**; Co-Principal Investigator: Prof. Ran Friedman, Linnaeus University, Sweden and Dr. Steve Donaldson, École Normale Supérieure, Paris. (10 million CPU hours Grant value: US$ 91,000)
11. Exploring Proton-catalyzed Reactions at Water-hydrophobe Interfaces via Ultrasensitive Mass-spectrometry and Ultrafast Surface-specific Spectroscopy. Competitive Research Grant, Office of Sponsored Research, KAUST. **Principal Investigator: H. Mishra**; Co-Principal Investigator: Prof. Richard Saykally (University of California Berkeley). ($400,000; 2016-2018).
12. Understanding the hydrogen-bonded percolation networks in water. KAUST Supercomputing Laboratory Grant. **Principal Investigator: H. Mishra**; Co-Principal Investigator: Prof. Vishwanath Dalvi, Institute of Chemical Technology, Mumbai, India. 2016-2017 (3 million CPU hours of value: US$ 40,000)

13. KAUST Conference: International Conference on Chemistries and Physics at Hydrophobic Interfaces. Office of Sponsored Research, KAUST. **Principal Investigator: H. Mishra**. 2015-2016. ($150,000)
14. Wetting of Graphene and Graphene Oxide Films: Implications for Desalination. KAUST SEED Funding, Office of Sponsored Research, KAUST. Principal Investigator: Daniel Bonn (University of Amsterdam); **Co-Principal Investigator: H. Mishra** 2016-2017 (US$ 100,000).

SELECTED PRESENTATIONS

1. Mishra, H., "Interface Engineering for Global Food–Water–Climate Security", University of California Davis, Biological and Agricultural Engineering Department, July 21, 2022 (Invited lecture)
2. Mishra et al., "Zwitterions at Electrified Interfaces", 11th International Colloids Conference, Lisbon, Portugal, June 2022 (Invited Keynote Speaker)
3. Arunachalam et al., "Diffusion-driven directional wetting of gas-entrapping microtextured surfaces (GEMS)", 48th international conference on Micro and Nano Engineering - Eurosensors (MNE-ES), Brussels, Belgium (Aug 17–19, 2022)
4. Cheng, L. et al., "Wax secretions of the ocean insect *Halobates* - functions and preliminary results", Trends in Natural Products Research: A PSE Young Scientists' Meeting", Crete, Greece (May 23-26, 2022)
5. Sadullah, Mohammed "Subkhi", et al., Droplet Adhesion Revisited, UK Fluids Conference, The University of Glasgow, Scotland (Sept 6–8, 2022)
6. Mishra, H., "On the Formation of Hydrogen Peroxide in Water Microdroplets", American Chemical Society (ACS) Meeting, Chicago (Aug 21–25, 2022); and Gordon Research Conference (GRC) on Water and Aqueous Solutions, Holderness, NH (July 25–29, 2022)
7. Shi, M., et al., "Slippery Liquid-Infused Surfaces from Sand Dollars", 2nd International Conference on Nature Inspired Surface Engineering (NISE-2022), Seoul National University, Seoul, South Korea (Aug 17–19, 2022)
8. Mishra, H., "On the Formation of Hydrogen Peroxide in Water Microdroplets", College of Chemistry, University of California Berkeley, Feb 10th, 2022 (Invited Online Lecture) Host: Prof. Richard Saykally
9. Mishra, H., "How Osmolytes Influence Electrostatics and Hydrophobic Surface Forces", Surfaces, Interfaces and Coatings Technologies International Conference, Barcelona, Apr 27–29, 2022 (Keynote)
10. Mishra, H., "A Nature-inspired Solution for Reducing Post-Harvest Storage Loss in the Developing World", 5th Edition of Global Virtual Conference on Food and Nutrition, Feb 14th, 2022 (Invited)
11. Maharjan et al., "How Osmolytes Influence Electrostatics and Hydrophobic Surface Forces", Advances in surfaces, Interfaces, and Interphases (online, May 15–18, 2022)

12. Mishra, H., "H_2O_2 production in Condensed Water Microdroplets: Facts and Artifacts", Chemistry Department, University of California Merced, August 20, 2021 (Invited online lecture)
13. Arunachalam, S., et al., Diffusion-Driven Directional Wetting Transitions, American Physical Society (APS) Conference (2021)
14. Arunachalam, S. et al., Durable Gas-Entrapping Microstructured Surfaces American Physical Society (APS) Conference (2021)
15. Shi et al., "Unexpected Leidenfrost Behaviors on Doubly Reentrant Pillars and Cavities", APS Fluid Dynamics Meeting (2021)
16. Qiang, et al., "Polymer filaments from bouncing drop" APS Fluid Dynamics Meeting (2021)
17. Zhang et al., "Trampolining Liquid Marbles", 47th International Conference on Micro and Nano Engineering, Turin, Italy (Sept 21-23, 2021)
18. H. Mishra, "On the Electrification of Water-Hydrophobe Interfaces", College of Chemistry, University of California Berkeley, USA (Host: Prof. Richard Saykally; June 26th, 2020)
19. H. Mishra, et al., "Exploring Fast Chemistries "On-Water": Emulsions, Sprays, and the Air-Water Interface", College of Chemistry, University of California Berkeley, CA, USA (Invited Physical Chemistry Seminar, October 15th, 2019)
20. H. Mishra, et al., "Exploring Fast Chemistries "On-Water": Emulsions, Electrosprays, and the Air-Water Interface", Division of Chemistry and Chemical Engineering, California Institute of Technology, Pasadena, CA, USA (Invited Chemical Physics Seminar, October 8th, 2019)
21. H. Mishra et al., "Insect-inspired Translational Research", NanoEngineering and Chemical Engineering Departments, University of California San Diego (Special Seminar, Oct 4, 2019)
22. H. Mishra et al., "Insect Inspiration: Fundamentals to Technologies", Department of Chemistry and Biochemistry, University of Maryland (Special Seminar, Oct 2, 2019)
23. H. Mishra et al., "Are Electrosprays Suitable for Investigating Chemistries at the Air-Water Interface?", Gordon Research Conference on Liquids, Aug 5-9, 2019, Holderness, NH (One of the eight posters selected from 150 poster-abstracts for 10-min talks)
24. H. Mishra** et al., "Electrification at Water-hydrophobe Interfaces", *Gordon Research Conference on Liquids*, New Hampshire, USA (Aug 5-9, 2019)
25. *The 45th Micro and Nano Engineering Conference*, Sept 10, 2019 (Greece): Arunachalam, S., "Putting *Cassie* Under Pressure"; Das, R* et al., "Biomimetic architectures for entrapping air underwater using wetting materials"; Ahmad, Z., "Inexpensive and Scalable Perfluorocarbon-free Gas Entrapping Surfaces/Membranes" (Best Poster Prize: Four posters recognized out of 404 entries)
26. H. Mishra, et al., "On the Assessment of Omniphobicity Derived from Intrinsically Wetting Materials", Poster presentation at the Heraeus Conference: Wetting on Soft or Microtextured Surfaces, Bad Honnef, Germany (Session Chair, Apr 11-13, 2019).

27. Nauruzbayeva, J. et al., "Nature-inspired Coating-free Membranes for Desalination", 28th Annual Meeting of the North American Membrane Society (NAMS), May 11-15, 2019 (Pittsburgh, PA, USA)
28. Das, R., "Bio-inspired Gas-entrapping Membranes (GEMs) for Coating-free Desalination", 6th Nano Today Conference, June 16-20, 2019 (Lisbon, Portugal)
29. *93rd ACS Colloid & Surface Science Symposium*, Georgia Institute of Technology, June 16-19, 2019: Ghifari, M. G. et al., "Long-range attraction between glycine-coated mica surfaces in ultra-dilute electrolytes"; Pillai, S. et al., "Molecular Insights into the Loss of Hydrophobicity of Desalination Membranes by Amphiphilic Contaminants"
30. Mishra, H. et al., "Hydrophobic Interactions Between Rigid Surfaces in Light and Heavy Water, Alcohols, and Various Electrolytes", *XVI Surface Forces Conference*, Kazan, Russia (August, 2018)
31. *Gordon Research Conference on Water and Aqueous Solutions*, New Hampshire, USA (July 25-29, 2018), entitled: Santana, A.** "Hydrophobic Interactions Between Rigid Surfaces in Light and Heavy Water", Nauruzbayeva, J.** "Contact Electrification at Extended Interfaces of Water and Hydrophobic Materials", Gallo, Jr., A.** "Chemistries in Electrosprays Do Not Represent Those at the Air-Water Interface", Ibrahim, M.** "Fries on-Water", Pillai, S.** "Hydrophobic Interactions Between Rigid Surfaces in Non-Aqueous Systems", Shrestha, B. R.** "Specific-ion Effects on Hydrophobic Interactions Between Rigid Surfaces", Mishra, H.** "Biomimetic Coating-free Surfaces for Desalination"
32. Mishra, H et al., "Coating-free Desalination Membranes from Mushroom-shaped Pores", *8th International Colloids Conference,* Shanghai, China (Invited Showcase Oral presentation, June 2018)
33. Gallo Jr., A. et al., "Inexpensive Superhydrophobic Sand Mulches for Dryland Agriculture", *255th American Chemical Society National Meeting and Expo*, New Orleans, USA (March, 2018)
34. *International Congress and Expo on Agriculture & Horticulture* 2018, Amsterdam: Gallo Jr., A. "Superhydrophobic Sand Mulches Reduce Water Needs and Improve Yields in Desert Agriculture"; Odokonyero, K.** "Economical Analysis of Biochar Derived from Maize Straw for Use as Soil Amendment"; and Odokonyero, K.** "Paraffin Wax Coated Jute Bags Reduce Moisture-induced Food Grain Storage Loss"
35. H. Mishra et al., "Bio-inspired Non-wetting Microtextures: Exploring New Avenues", *Living Light 2018*, Cambridge University, UK (March 11-14, 2018)
36. H. Mishra et al., "Inexpensive Superhydrophobic Sand Mulches for Desert Agriculture", *7th International Colloids Conference*, Sitges, Barcelona, Spain (2017) (Elsevier Best Poster Award)
37. A. Gallo Jr., et al., "Superhydrophobic Sand Mulches", *5th Water Arabia Conference and Exhibition*, Al Khobar, Saudi Arabia (2017) (First Prize, Doctoral Students Category)
38. Shrestha, B. et al., "Surface Force Apparatus in Hydrophobic Interactions", *International Chemical Congress for Sustainable Development*, Nepal (2018) (Young Scientist Award)

39. Mishra, H. et al., Isotope Effects on Hydrophobic Interactions, *The 8th Biennial Australian Colloid and Interface Symposium*, Coffs Harbor, Australia (January 29-February 3, 2017)
40. Mishra, H et al., "On Time-Dependent Filling of Doubly Reentrant Cavities", *EMN Meeting on Texture and Microtexture*", Hong Kong, (December, 2016) (Invited talk)
41. Mishra, H et al., "Mechanistic Insights into Acid-catalyzed Reactions 'On-water'", *International Conference on Science and Technology of Engineering Materials* Pattaya, Thailand (July, 2016) (Best Presentation Award)
42. Mishra, H et al., "The Hydrophobic Interaction: Effects of H-bonding Networks, Heavy vs Light Water, and Ions", *Conference on Ions in Solutions: Biology, Energy and Environment*, Telluride Science and Research Center, Colorado (July 11-17, 2016)
43. Mishra, H et al., "Wetting of Surfaces with Reentrant and Doubly Reentrant Cavities", *6th International Colloids Conference,* Berlin (June 19-22, 2016)
44. H. Mishra et al., "A predictive, unified model for contact angles for surfaces with reentrant features", *5th International Colloids Conference*, Amsterdam, The Netherlands (June, 2015)

BEFORE JOINING KAUST

45. H. Mishra et al., "Why is the air-water interface negatively charged?", *7th Annual Conference on the Physics, Chemistry and Biology of Water*, Vermont, USA (Oct. 2012) (Gilbert Ling Prize)
46. H. Mishra et al., Anions Dramatically Enhance Proton Transfer across Water Interfaces", *International Society for Theoretical Chemical Physics-VII*, Waseda, Japan, September, 2011 (The Young Investigator Award)
47. H. Mishra et al., Boron-selective chelating resins from dendritic macromolecules, 9th Symposium on Nanotechnology and the Environment: Green Nanotechnology, *ACS National Meeting,* California, USA (March, 2011)
48. H. Mishra et al., Functional porous microspheres from hyperbranched polymers: synthesis, characterization and applications to boron removal from water, *NSF CMMI Research and Innovation Conference*, Georgia Institute of Technology, Atlanta, USA, Jan, 2011 (NSF Travel Award)
49. H. Mishra et al., "Electrodeposition of bismuth telluride films onto carbon nanotube arrays", *Cooling Technologies Research Center Annual Meeting*, Purdue University, (Jun, 2008) (Best Poster Award)
50. H. Mishra, "Applying projection theorem to an equilibrium equation", *Proceedings of the 10th Annual Conference on Mathematical Modeling organized by the Vijnãna Parishad of India*, National Institute of Technology, Bhopal, India (May, 2004) (The Best Paper Award)

RESEARCH SUPERVISION AT KAUST

Primary Supervision - Masters	Primary Supervision – PhD	Post Doc Supervision
Completed: 8 In Progress: 7	Completed: 3 In Progress: 5	Total: 12

PHD ADVISING

1. Dr. Adair Gallo Jr., Superhydrophobic Sand Mulches for Controlling Evaporative Losses in Aridland Agriculture: Fundamentals and Applications (2018–2021). Current position: CEO, KAUST Start-up
2. Dr. Sreekiran Pillai, EnSE; Investigating hydrophobic interactions between extended surfaces (Aug, 2015 – Dec, 2019). Current position: Postdoctoral Scholar, North Carolina State University, USA
3. Dr. Jamilya Nauruzbayeva, EnSE; Contact electrification at water-hydrophobe interfaces: fundamentals and applications (2018–2022). Got multiple job offers – deciding.
4. Sankara Arunachalam, EnSE; Bio-inspired gas-entrapping microtextures: fundamentals and applications (Fall 2020 – expected to finish in 2023).
5. Yingfeng Xu, EnSE; Interactions between hydrophobic surfaces across water (Fall, 2021 – expected to finish in 2024)
6. Bob Vernooij, EnSE; Investigation of coastal, marine, and cosmopolitan Halobates insects in the Red Sea (Spring 2022–expected to finish in 2025)
7. Muzzamil Eatoo, EnSE; Electrochemistry in aqueous H_2O_2 solutions (Spring 2022 –)

MS ADVISING

1. Aniela Zarzar Torańo, Chemical Science; Chemical surface modifications of silica for the removal of textile dyes in wastewater (Fall 2015 – Summer 2017). Current position: Reliability Engineer, Saudi Aramco, Dhahran, KSA.
2. Joel Reihmer, EnSE; Synthesis and characterization of hydrophobic granules and application in desert agriculture (Fall 2015 – Spring 2017). Current position: Chemist, Jim Bean, Kentucky, USA
3. Kuang-Hui Li, Materials Science; Surface functionalization of mica (Spring 2015 – Summer 2016). Current position: Research Engineer, TSMC, Taiwan.
4. Maria Fernanda Nava Ocampo, EnSE; Investigating effects of hypertonic saline solutions on lipid monolayers at the air-water interface as surrogates for lung surfaces (Fall 2015 – Summer 2017). Current position: PhD student, WDRC, KAUST.
5. Adair Gallo Jr, EnSE; An investigation of chemical landscapes in aqueous electrosprays by tracking oligomerization of isoprene (MS: Summer 2016 – Fall 2017). Current position: KAUST Start-up.
6. Muhammad Ghifari Ridwan, EnSE; Probing Slippery Liquid-infused Surfaces at the Nanoscale (Fall 2018 – Fall 2019; MS Student, WDRC, KAUST). Current position: Associate Manager, ACWA Power.
7. Zain Ahmad, EnSE; An experimental and theoretical investigation of pressure-induced wetting transitions, (Fall 2018 – Fall 2019). Current position: PhD student at Imperial College, London.

8. Abdulaziz A. Alruwaithi, Chemical Science; Investigating “On-water” Reactions using Microfluidics (Fall 2019 – Spring 2020). Current position: Business Analyst, Monz (Saudi Arabia).
9. Vinicius dos Santos, Chemical Science (Fall 2020 –)
10. Nayara Musskopf, EnSE (Fall 2020 –)
11. Nischal Maharjan (Spring 2021–)
12. Abdul-Malik Ghoneim (Fall 2021–)
13. Batool Albar (Spring 2022–)
14. Amr Al-zubi (Spring 2022–)
15. Lisa Oki Exposito (Spring 2022–)

POSTDOCTORAL SCHOLARS ADVISING

1. Dr. Andreia S. F. Farinha (2015-2016)
    - Current position/location: Director of Research in a start-up in Portugal.
2. Dr. Patricia Martins (2017-2018)
    - Current position/location: Scientist, Pharma company, Sweden
3. Dr. Cristina Chiutu (2015-2016)
    - Current position/location: Master Student in Robotics, University of Craiova
4. Dr. Buddha Shrestha (2017-2021)
    - Current position/location: Researcher in Canada
5. Dr. Adriano Sanchez (2017-2020)
    - Current position/location: Postdoctoral Fellow, WDRC, KAUST
6. Dr. Ratul Das (2017-2020)
    - Current position/location: Senior Manager, ACWA Power R&D, Saudi Arabia
7. Dr. Mahmoud Ibrahim (2018-2020)
    - Current position: Postdoc in France
8. Dr. Meng Shi (2019- 2021)
    - Current position: Postdoc at KAUST
9. Dr. Peng Zhang (2019 - 2021)
    - Current position: Research Scientist in my group.
10. Dr. Kennedy Odokonyero (2018-)
11. Dr. Mohamed Subkhi Sadullah (2021 –)

RESEARCH SCIENTISTS

1. Dr. Peng Zhang (2021–)

LAB TECHNICIANS

1. Dr. Eddy Domingues (June, 2015-Oct, 2017); Current position: Scientist, AFRY, Sweden
2. Dr. Navaladian Subramanian (October, 2015-2017). Current position: Entrepreneur
3. Mr. Sankara Arunachalam (2015 - 2020). Current position: PhD student, KAUST
4. Mr. Edelberto Manalastas (2017 - 2021). Current position: Technician, USA

INTERNS WITH A GRADUATE DEGREE

1. Batool Albar (VSP), UC Davis (Fall 2021) Wax loading in SandX and biochar ion-exchange capacity characterization;
2. Olena Samonina (VSRP), National University of Kyiv-Mohyla Academy (2021) Collection and characterization of Halobates insects in and around KAUST mangroves;
3. Abdulmalik Al-Ghonaim (KAUST Gifted Students Program), MIT (June-August, 2020) Simulating interference in cavities comprising five optical layers;
4. Nischal Maharjan (VSP) (2019) Functionalization of mica films prior to surface force measurements;
5. Vinicius dos Santos (VSP) (2019) Greenhouse study of superhydrophobic sand on tomato plants;
6. Nayara Musskopf (VSP) (2019) Spontaneous formation of H2O2 in water microdroplets;
7. Muhammad G. Ridwan (VSP) (March-August, 2016) Water-flooding in calcite microchannels;
8. Adair Gallo Jr. (VSRP) (2016) Superhydrophobic Sand;
9. Dipti Raj (VSP), IIT Kharagpur (June-Aug, 2015) Wetting transitions on rough surfaces;
10. Emilie Dauzon (VSP) (March-August, 2015) Electrification at solid-solid interfaces;
11. Mohamed Ben Hsine (VSP), INSAT, Tunis (March-Aug, 2015) Filtration device from plant shoot.

UNIVERSITY SERVICE

UNIVERSITY COMMITTEES

- Student Recruitment Group (led by the Provost)
- Search Committee Member for Plant Growth Facility Director
- Official faculty mentor for an Assistant Professor (Provost Office program)
- Official faculty mentor for a postdoc (VPR Office program)
- KAUST President's Academic Council (2019 - 2020)
- Admissions Committee Chairperson, EnSE Program (2017 - 2021)
- Representative of the Biological and Environmental Science and Engineering Division for the Faculty Learning Program (FLP), Berkeley Center for Teaching and Learning, University of California Berkeley (August 2018)
- Faculty Committee Member: Plant Growth Core Lab (2019- 2021); Nanofabrication Core Lab, KAUST (2018- 2020); Analytical Core Lab, KAUST (2016-2018)

PUBLIC OUTREACH ACTIVITIES

1. SandX demonstration at Saudi International Golf Tournament at King Abdullah Economic City (KAEC) February 2022
2. Speaker and panelist at KAUST Gifted Student Program (KGSP) recruitment event (Jan 14–15, 2022)
3. Invited Speaker, King Abdulaziz City for Science and Technology (KACST) Webinar on Saudi Green Initiative (Dec 14, 2021); selected speakers from KAUST, Caltech, and UC Berkeley.
4. Invited Speaker, Saudi Aramco Webinar on Saudi Green Initiative (Dec 5, 2021)
5. SandX demonstration at KAUST Research Open Week (Nov. 28, 2021):

6. Speaker at Visiting Student Internship recruitment event (Nov. 12, 2021)
7. Developed an internship program for the KAUST School (TKS) students (Fall, 2020).
8. The KAUST School Curriculum Committee (2019 - present); speaker at The KAUST School
9. Lecture on (and demo of) Superhydrophobic Sand (SHS) technology at the Global Forum for Innovators in Agriculture (GFIA), Abu Dhabi (Apr 1-2, 2019)
10. Panel Discussions:
    a. KAUST Sci Café on Water Security (March 8, 2019). https://www.youtube.com/watch?v=Zgn8kiRVAqQ&t=122s
    b. Lecturer and panelist at the United Nations' COP-24 Conference, Katowice, Poland (Dec 5, 2018): https://www.facebook.com/watch/?v=715664815547200
11. Nature Research Chemistry Community Blogs:
    a. https://chemistrycommunity.nature.com/users/174953-himanshu-mishra/posts/44910-calling-on-to-women-meches
    b. https://chemistrycommunity.nature.com/users/174953-himanshu-mishra/posts/38606-our-journey-towards-coating-free-liquid-repellent-surfaces

PROFESSIONAL SERVICE

Organizer of the International Conference on Physics and Chemistries at Hydrophobic Interfaces at KAUST during February 14-17, 2016 (US $ 150,000 award from the Office of Sponsored Research

REVIEWERSHIP FOR JOURNALS

Nature Reviews Chemistry, Journal of the American Chemical Society, *Chemical Science*, *Advanced Functional Materials*, *Advanced Materials Interfaces*, *Scientific Reports*, *Langmuir*, *Analyst*, *Journal of Colloid and Interface Science, Petroleum Science, Chemical Engineering Science, Journal of Physical Chemistry Letters, International Journal of Heat and Mass Transfer, Frontiers in Mechanical Engineering.*