

# CURRICULUM VITAE

## Ankur Gupta

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<https://www.colorado.edu/faculty/gupta/>

## Professional Experience & Education

- 2021-present                      Tenure-Track Assistant Professor, Chemical and Biological Engineering Department  
University of Colorado, Boulder  
*Principal Investigator: Laboratory of Interfaces, Flow and Electrokinetics (LIFE)*
- 2017-2020                         Postdoctoral Research Associate, Mechanical and Aerospace Engineering  
Princeton University  
Adviser: Prof. Howard. A. Stone  
*Research area: Electrokinetics, energy storage, wetting on textured surfaces*
- 2012-17                             PhD, Chemical Engineering  
Massachusetts Institute of Technology (MIT)  
Advisers: Prof. Patrick S. Doyle and Prof. T. Alan Hatton  
*Research area: Nanoemulsions, microscale flows, soft matter*
- 2012-14                             M.S., Chemical Engineering Practice  
Massachusetts Institute of Technology (MIT)
- 2008-12                             B.Tech, Chemical Engineering  
Indian Institute of Technology (IIT) Delhi  
Adviser: Prof. Shantanu Roy  
*Awarded with the prestigious Presidents' Gold Medal for securing highest GPA across all majors in the graduating class of 2012*

## Selected Awards & Honors

- 2018                                 Publons Peer-review Award for placing in top 1% of reviewers
- 2016-17                             Hugh Hampton Young Fellow, MIT
- 2017                                 Individual Citation Award for Teaching and Outreach, MIT
- 2016                                 Dow Travel Award, 2016 Annual AIChE Meeting
- 2014                                 Student-Member Travel Grant, 86th Annual SOR Meeting
- 2012                                 Presidents' Gold Medal, highest GPA across all majors in the graduating class of 2012, IIT Delhi
- 2012                                 Kalpana Chawla Scholarship for contributions to research, IIT Delhi

## Publications

[link to google scholar profile](#)

‡ denotes corresponding author, \* denotes equal contribution

23. **A. Gupta**<sup>‡</sup>, A. Govind Rajan, Emily A. Carter, H.A. Stone<sup>‡</sup>  
*Thermodynamics of Electrical Double Layers with Electrostatic Correlations*  
The Journal of Physical Chemistry C, 124, 26830, 2020
22. **A. Gupta**<sup>‡</sup>, A. Govind Rajan, Emily A. Carter, H.A. Stone<sup>‡</sup>  
*Ionic layering and overcharging in a Poisson-Boltzmann model*  
Physical Review Letters, 125, 188004, 2020
21. **A. Gupta**<sup>‡</sup>, P. J. Zuk<sup>‡</sup>, H.A. Stone<sup>‡</sup>  
*Charging dynamics of overlapping double layers in a cylindrical nanopore*  
Physical Review Letters, 126, 076001, 2020

20. **A. Gupta**, S. Shim, H.A. Stone  
*Diffusiophoresis: From dilute to concentrated electrolytes*  
Soft Matter, 16, 6975, 2020  
*accepted by inside front cover*
19. **A. Gupta**  
*Nanoemulsions*, invited book chapter in *Nanoparticles for Biomedical Applications: Fundamental Concepts, Biological Interactions and Clinical Applications*  
edited by Eun Ji Chung, Lorraine Leon and Carlos Rinaldi, Elsevier publication
18. J.L. Wilson, S. Shim, E. Yu, **A. Gupta**, H.A. Stone  
*Diffusiophoresis in Multivalent Electrolytes*  
Langmuir, 36, 7014, 2020,
17. **A. Gupta**, S. Shim, L. Issah, C. McKenzie, H.A. Stone  
*Diffusion of multiple electrolytes cannot be treated independently: Model predictions with experimental validation*  
Soft Matter, 15, 9965, 2019
16. Y. Liu, B. Rallabandi, L. Zhu, **A. Gupta**, H.A. Stone  
*Pattern formation in oil-in-water emulsions exposed to a salt gradient*  
Physical Review Fluids, 4, 084307, 2019 [[link](#)]
15. **A. Gupta**, B. Rallabandi, H.A. Stone  
*Diffusiophoretic and Diffusioosmotic Velocities for Mixtures of Valence-asymmetric Electrolytes*  
Physical Review Fluids, 4, 043702, 2019 [[link](#)]
14. K. Singh, **A. Gupta**, A. Buchner, F. Ibis, J.W. Pronk, D. Tam, H.B. Eral  
*A Low-cost Centrifugal Homogenizer for Emulsification & Mechanical Cell Lysis*  
Journal of Colloidal and Interface Science, 547, 127, 2019 [[link](#)]
13. **A. Gupta**, H. A. Stone  
*Electric Double Layers: Effect of Asymmetry in Electrolyte Valence on Steric Effects, Dielectric Decrement and Ion-Ion Correlations*  
Langmuir, 34, 11971, 2018 [[link](#)]
12. **A. Gupta\***, H. Lee\*, P.S. Doyle  
*Oil Recovery from Micropatterned Triangular Troughs during a Surfactant Flood*  
Langmuir, 34, 10644, 2018 [[link](#)]
11. A.Z.M. Badruddoza\*, **A. Gupta\***, B.L. Trout, A.S. Myerson, P.S. Doyle  
*Low Energy Nanoemulsions as Templates for the Formulation of Hydrophobic Drugs*  
Advanced Therapeutics, 1700020, 2018 [[link](#)]
10. **A. Gupta\***, H. Lee\*, P.S. Doyle  
*Controlled Liquid Entrapment over Patterned Sidewalls in Confined Geometries*  
Physical Review Fluids, 2, 094007, 2017 [[link](#)]
9. **A. Gupta\***, A.Z.M. Badruddoza\*, T.A. Hatton, P.S. Doyle  
*A General Route for Nanoemulsion Synthesis using Low Energy Methods at Constant Temperature*  
Langmuir, 33, 7118, 2017 [[link](#)]
8. H. Lee\*, **A. Gupta\***, T.A. Hatton, P.S. Doyle  
*Controlled Entrapment of Liquid Isolated Chambers through Photo-patterned Obstacles*  
Physical Review Applied, 7, 004013, 2017 [[link](#)]
7. **A. Gupta**, V. Narsimhan, T.A. Hatton, P.S. Doyle  
*Kinetics of Change in Droplet Size during Nanoemulsion Formation*  
Langmuir, 32, 11551, 2016 [[link](#)]

6. S.G.Lee, H. Lee, **A. Gupta**, P.S. Doyle  
*Site-selective In Situ Grown Carbonate Micromodels with Tunable Geometry, Porosity, and Wettability*  
Advanced Functional Materials 26, 4896, 2016 [[link](#)]
5. **A. Gupta**, H.B. Eral, T.A. Hatton, P.S. Doyle  
*Nanoemulsions: Formation, Properties and Applications*  
Soft Matter, 12, 2826, 2016 [[link](#)]
4. **A. Gupta**, H.B. Eral, T.A. Hatton, P.S. Doyle  
*Controlling and Predicting Droplet Size of Nanoemulsions: Scaling Relations with Experimental Validation*  
Soft Matter, 12, 1452, 2016 [[link](#)]
3. G.C.L. Goff, J. Lee, **A. Gupta**, W.A. Hill, P.S. Doyle  
*High-Throughput Contact Flow Lithography*  
Advanced Science, 2, 10, 2015 [[link](#)]
2. H. Lee, R.L. Srinivas, **A. Gupta**, P.S. Doyle  
*Sensitive and Multiplexed On-Chip microRNA Profiling in Oil-Isolated Hydrogel Chambers*  
Angewandte Chemie, 127, 2507, 2015 [[link](#)]
1. **A. Gupta**, S. Roy  
*Euler-Euler Simulation of Bubbly Flow in a Rectangular Bubble Column: Experimental Validation with Radioactive Particle Tracking*  
Chemical Engineering Journal, 225, 818, 2015 [[link](#)]

## Invited Talks

1. University of Alberta, Chemical Engineering, 04/15/2019
2. National University of Singapore, Chemical Engineering, 04/01/2019
3. Case Western Reserve University, Chemical Engineering, 03/25/2019
4. Michigan State University, Chemical Engineering, 03/05/2019
5. University of Colorado Boulder, Chemical Engineering, 02/28/2019
6. Colorado School of Mines, Chemical Engineering, 02/21/2019
7. University of Oklahoma, Chemical Engineering, 02/15/2019
8. Indian Institute of Technology (IIT) Delhi, Chemical Engineering, 02/05/2019
9. Indian Institute of Science (IISc) Bangalore, Chemical Engineering, 01/30/2019
10. University of California Davis, Chemical Engineering, 01/10/2019
11. University of Wisconsin Madison, Chemical Engineering, 12/05/2018
12. University of Waterloo, Chemical Engineering, 08/31/2018
13. Ryerson University, Mechanical and Industrial Engineering, 08/29/2018
14. Ryerson University, Chemical Engineering, 08/29/2018
15. McMaster University, Chemical Engineering, 08/28/2018
16. McGill University, Chemical Engineering, 08/24/2018
17. University of Toronto, Chemical Engineering, 08/08/2018
18. University of British Columbia, Mechanical Engineering, 08/02/2018
19. Air Products, Allentown Pennsylvania, 03/03/2017
20. Complex Fluids Group, Princeton University, 12/19/2016
21. The Dow Chemical Company, Midland, Michigan, 10/25/2016
22. Indian Institute of Technology (IIT) Delhi, Chemical Engineering, 03/18/2016
23. The Bigger Role of Nanoemulsions, invited interview, Chemical Today  
(link: <http://bit.ly/2uwri8E>)

## Conference Presentations

1. **A. Gupta**, P. J. Zuk, S. Shim, H. A. Stone  
Thick Double Layers: From Energy Storage to Diffusiophoresis  
73<sup>rd</sup> APS - Division of Fluid Dynamics, Chicago, Illinois, 11/22/2020 (*remote meeting*)
2. **A. Gupta**, A. G. Rajan, E. Carter, H. A. Stone  
Electrical Double Layers: Predicting Overcharging and Layering of Ions using Continuum Model  
72<sup>nd</sup> APS - Division of Fluid Dynamics, Seattle, Washington, 11/26/2019
3. **A. Gupta**, B. Rallabandi, J. L. Wilson, S. Shim, H. A. Stone  
Diffusiophoretic Velocity for Mixture of Electrolytes with Asymmetric Ion Valences  
2019 Annual AIChE Meeting, Orlando, Florida, 11/13/2019
4. **A. Gupta**, H. A. Stone  
Electric Double Layers: Effect of Asymmetry in Electrolyte Valence on Finite Ion Size Effects, Dielectric Decrement and Ion-Ion Correlations  
2018 Annual AIChE Meeting, Pittsburgh, Pennsylvania, 11/01/2018
5. **A. Gupta**, A. Z. M. Badruddoza, P. S. Doyle  
A General Route for Nanoemulsion Synthesis Using Low Energy Methods at Constant Temperature  
2017 Annual AIChE Meeting, Minneapolis, Minnesota, 11/02/2017
6. **A. Gupta**, T. A. Hatton, P. S. Doyle  
Nanoemulsion Formation: Controlling and Predicting Droplet Size  
2017 Annual AIChE Meeting, Minneapolis, Minnesota, 10/31/2017
7. **A. Gupta**, H. Lee, T. A. Hatton, P. S. Doyle  
Controlled Liquid Entrapment through Photo-Patterned Obstacles and Patterned Surfaces  
2017 Annual AIChE Meeting, Minneapolis, Minnesota, 10/30/2017
8. **A. Gupta**, T. A. Hatton, P. S. Doyle  
Nanoemulsion Formation: Controlling and Predicting Droplet Size  
2016 Annual AIChE Meeting, San Francisco, California, 11/15/2016
9. **A. Gupta**, H. Lee, T. A. Hatton, P. S. Doyle  
Controlled Oil Entrapment through Photo-Patterned Obstacles  
2016 Annual AIChE Meeting, San Francisco, California, 11/14/2016
10. **A. Gupta**, T. A. Hatton, P. S. Doyle  
Nanoemulsion Formation: Controlling and Predicting Droplet Size  
90th ACS Colloids Meeting, Cambridge, Massachusetts, 06/07/2016
11. **A. Gupta**, T. A. Hatton, P. S. Doyle  
Nanoemulsion Formation: Controlling and Predicting Droplet Size  
90th ACS Colloids Meeting, Cambridge, Massachusetts, 06/07/2016
12. **A. Gupta**, H. B. Eral, T. A. Hatton, P. S. Doyle  
Controlling and Predicting droplet Size of Nanoemulsions  
10th Annual European Rheology Conference, Nantes, France, 04/16/2015
13. **A. Gupta**, H. B. Eral, T. A. Hatton, P. S. Doyle  
Understanding the Physics of Nanoemulsion Formation  
The Society of Rheology 86th Annual Meeting, Philadelphia, Pennsylvania, 10/07/2014

## Referee Experience

*Independently reviewed more than 95 papers in over 30 different journals* ([link to Publons profile](#))

1. Angewandte Chemie
2. Advanced Functional Materials

3. ACS Applied Materials & Interfaces
4. Langmuir
5. Soft Matter
6. Food and Bioproducts Processing
7. AIChE Journal, Physical Review Fluids
8. Chemical Engineering & Processing: Process Intensification
9. Industrial & Engineering Chemistry Research
10. Food & Function
11. Journal of Physics: Condensed Matter
12. Journal of Dispersion Science and Technology
13. Colloids and Surfaces A: Physicochemical and Engineering Aspect
14. Food Hydrocolloids
15. International Journal of Multiphase Flows
16. Food Research International
17. Journal of Agricultural and Food Chemistry
18. Fluid Dynamics & Materials Processing
19. Carbohydrate Polymers
20. European Journal of Lipid Science & Technology
21. Journal of Colloid & Interface Science
22. Food Chemistry
23. Comprehensive Reviews in Food Science and Food Safety
24. International Journal of Heat & Mass Transfer
25. The European Physical Journal E
26. Journal of Micromechanics & Microengineering
27. Comprehensive Reviews in Food Science & Food Safety
28. Physica A: Statistical Mechanics and Its Applications
29. Physical Review Letters
30. Physical Review Fluids
31. Journal of Fluid Mechanics
32. Foundation of Scientific Research - Flanders (FWO, Brussels) (grant review)
33. ACS Petroleum Research Fund (grant review)
34. National Frontiers in Research Fund, Canada (grant review)

## Teaching Experience

1. **Instructor, Transport Phenomena (CHEN5210)**  
 University of Colorado Boulder, Spring 2021  
 Course level: graduate, class strength: 34  
 Responsibility: Developing and delivering lectures (30 lecture of 75 min each), designing problem sets and exams, grading, conducting office hours
2. **Guest Lecturer, Advanced Heat and Mass Transfer (CBE505)**  
 Princeton University, Spring 2020  
 Course level: graduate, class strength: 25  
 Responsibility: developed and delivered 3 lectures on electrokinetics (*delivered remotely due to COVID-19*)

3. **Instructor, Electrokinetics for Energy and the Environment (MAE 559)**  
Princeton University, Fall 2018  
Course level: graduate, class strength: 20 (including audit, listeners)  
Responsibility: developed and delivered 75% of lectures  
Evaluation: 3.75/5 (lectures), 4.0/5 (course content)
4. **Graduate Instructor, Fluid Mechanics (10.301)**  
MIT, Spring 2017  
Course level: undergraduate, class strength: 58  
Responsibility: 40% lectures, 50% recitations  
designed and recorded a supplementary video lecture series (web link: <http://bit.ly/2tN87UX>)  
Evaluation: 6.2/7 (lectures), 6.9/7 (recitations)
5. **Teaching Assistant, Transport Processes (10.302)**  
MIT, Fall 2014  
Course level: undergraduate, class strength: 71  
Evaluation: 6.5/7
6. **Teaching Assistant, Junior Design Course (CHL471)**  
IIT Delhi, Spring 2012  
Course level: undergraduate, class strength: 120
7. **Instructor of Mathematics and Physics, Vidyamandir Classes**  
Delhi, 2009-11  
Course level: high school, class strength: 400 (40 × 10)

## Mentor Experience

1. Nathan Jarvey, University of Colorado Boulder, graduate research, 2021 - present
2. Filipe Henrique, University of Colorado Boulder, graduate research, 2021 - present
3. Jackson Shropshire, University of Colorado Boulder, undergraduate research, 2020
4. Ben Alessio, Princeton University, undergraduate research, 2020 - present
5. Azmaine Iqtidar, Princeton University, undergraduate research, 2020
6. Comsin Andrei, Princeton University, undergraduate research, 2019
7. Cameron McKensize, Princeton University, undergraduate thesis, 2018-19
8. Connor H. Matthews, Princeton University, undergraduate research, 2018-19
9. Lisa E. Archibald, MIT, undergraduate research, 2016-17
10. Mohammad Alsobay, MIT, undergraduate course project, 2015
11. Galym Saparbaiuly, MIT, undergraduate course project, 2015
12. Elezhan Zhakiya, MIT, undergraduate course project, 2015
13. Robbie Shaw, MIT, undergraduate research, 2014-15

## Industrial Experience

1. Consultant, Alcon Incorporated, Dallas, TX and Atlanta, GA, 11-12/2013
2. Consultant, Corning Incorporated, Corning, NY and Wilmington, NC, 09-10/2013
3. Student Intern, Haldor Topose, Lyngby, Denmark, 05-07/2011

## Leadership Roles

1. **Mechanical & Aerospace Engineering Postdoctoral Association, Princeton University, 2018-2019**  
Organized several 'Meet the Faculty' luncheons to facilitate interaction amongst postdoctoral researchers and faculty members within the department

**2. Founder, iitjeelectures.com, 2015-present**

Creating free online lectures to democratize high school education in India, leading a group of 3 members  
More than 150 videos available on our youtube channel, over 10,000 subscribers and 100,000 views  
Partial content uploaded on MIT OCW high school page (link: [urlhttp://bit.ly/2tobvc0](http://bit.ly/2tobvc0))

**3. Graduate Student Adviser Board, Chemical Engineering, MIT, 2013-16**

Conceptualized and successfully implemented Open Labs for improving the adviser selection process;  
the initiative is now an integral part of fall semester schedule

Active member of several GSAB initiatives like Student-Adviser Review Form

**4. Board Member, Association for India's Development, MIT, 2014-17**

Actively involved in raising awareness about socio-economic issues through articles and workshops  
Organized a fund raiser with a budget of over \$25,000 for grass root development projects in India

**5. Dorm Coordinator, Tang Hall Residents Association, MIT, 2015-16**

Implemented a swift feedback system in the dorm by installing suggestion boxes at strategic locations  
Organized several creative workshops such as 'Conflict Management' and 'Money Management 101'  
Awarded with the best officer award for exceptional service and resident welfare