

Vineeth ‘Vinny’ Chandran Suja

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EDUCATION AND EXPERIENCE

| | | |
|----------------------------|--|----------------------------|
| Harvard University | Postdoc in Bioengineering (Advisor: Prof. Samir Mitravotri) | Jan, 2021 - <i>present</i> |
| Stanford University | PhD in Chemical Engineering (Advisor: Prof. Gerry Fuller) | Dec, 2020 |
| Ecole Polytechnique, Paris | Masters in Mechanics (Advisors: Prof. Abdul Barakat and David Quéré) | Aug, 2015 |

ACADEMIC APPOINTMENTS

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| Guest Editor, American Institute of Physics - Physics of Fluids | Sep 2022 – <i>present</i> |
| Research fellow, Massachusetts General Hospital | Jan 2022 – <i>present</i> |
| Guest Editor, Journal of Visual Experiments | Dec 2021 – Dec 2022 |
| Guest Editor, Coatings | Nov 2021 – Aug 2022 |
| Research fellow, Wyss Institute for Biologically Inspired Engineering | Jan 2021 – <i>present</i> |
| Postdoctoral Fellow, School of Engineering and Applied Sciences, Harvard | Jan 2021 – <i>present</i> |

AWARDS AND HONORS

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| • Rising Star in Soft and Biological Matter (NSF MRSEC) | 2023 |
| • International Congress of Rheology Gallery Contest Award | 2020 |
| • Scientific Curiosity Award (World Young Scientist Summit, Wenzhou, China) | 2019 |
| • Centennial TA award (Highest Honor for TA's at Stanford University) | 2019 |
| • TA of the Year Award (Department of Chemical Engineering) | 2018 |
| • NorCal STLE Research Scholarship | 2016 |
| • Université Paris-Saclay Outgoing Student Mobility Scholarship | 2015 |
| • Charpak Scholar, Embassy of France in India | 2014 |
| • Junior Research Fellow, Council for Industrial and Scientific Research-India | 2013 |

INVITED ARTICLES

1. Fuller, G. G. & **Chandran Suja, V.** (2020). The Froth Thickens. *Invited Viewpoint, American Physical Society* doi:v13/162
2. **Chandran Suja, V.** & Fuller, G. G. (2023). From improving eyesight to disease theranostics: The impact of ocular fluid mechanics research. *Invited Editorial, Physics of Fluids* doi:10.1063/5.0168773

PUBLICATIONS

Key manuscripts (Reverse Chronological):

3. **Chandran Suja, V.***, Qi, Q* et al, A biomimetic chip to assess subcutaneous bioavailability of monoclonal antibodies in humans. (2023) *Proceedings of the National Academy of Sciences Nexus In Press* * Equal contribution
4. L. Wang, Y. Gao, **V. Chandran Suja** et al, Macrophage hitchhiking Gadolinium micropatches: A living contrast agent for diagnosis of traumatic brain injury. (2023) *Science Translational Medicine Accepted*
5. Y. Huang*, **V. Chandran Suja*.#**, M. Yang, A. V. Malkovskiy, A. Tandon, A. Colom, J. Qin & G. G. Fuller #. (2023). An investigation of mechanical stresses on droplet interface bilayers using fluorescence

lifetime imaging microscopy. *Journal of Colloid and Interface Science* 653, 1196-1204 * Equal contribution, # **Co-senior author**

6. Zhao, Z., Kim, J., **Chandran Suja, V.**, N Kapate & Mitragotri, S. Red Blood Cell Anchoring Enables Targeted Transduction and Re-Administration of AAV-Mediated Gene Therapy. (2022) *Advanced Science*
7. Tammaro, D., **Chandran Suja, V.***, Kannan, A.*, Gala, L.D., Maio, D.E., Fuller, G. G., & Maffettone, P.L. (2021). Flowering in bursting bubbles with viscoelastic interfaces *Proceedings of the National Academy of Sciences*, 118(30), e2105058118. * Equal contribution
8. Kannan, A., Shieh, I., Negulescu, P., **Chandran Suja, V.** & Fuller, G. G. (2021) Adsorption and aggregation of monoclonal antibodies at silicone oil-water interfaces. *Molecular Pharmaceutics*
9. **Chandran Suja, V.**, Sentmanat, J., Scales, C., Hoffman, G. & Fuller, G. G. (2020). Hyperspectral imaging for dynamic thin film interferometry. *Scientific reports*, 10(1), 11378.
 - *Industrial/Clinical Translation*: Patented instrument (see patents section) reported in the paper acquired by Vision Care division of Johnson & Johnson for \$90,000 and undergoing in house clinical trials. The same instrument was also acquired by the Head, Surgical and Vision care research division of Alcon for a sum exceeding \$250K for end-user ophthalmic product development.
10. **Chandran Suja V.**, Kar, A., Cates, W., Remmert, S. M., Savage, P. D. & Fuller, G. G. (2018). Evaporation-induced foam stabilization in lubricating oils. *Proceedings of the National Academy of Sciences*, 115(31), 7919-7924.
 - *Trade Journal Coverage*: Highlighted in Tribology and Lubrication Technology Magazine Dec 2018 (Author Dr. Neil Canter)
 - *Major Press Coverage*: Stanford News, Phys.org, and 2 others.
11. **Chandran Suja, V.** & Barakat, A. I. (2018). A Mathematical Model for the Sounds Produced by Knuckle Cracking. *Scientific reports*, 8(1), 4600.
 - Nature Scientific Reports Top 10 paper (2018)
 - *International Awards*: World Young Scientist Summit - Scientific Curiosity Award (Night of Science Pineapple Science Award)
 - *Major Press Coverage*: ScienceAlert, BBC, Times, New York Times, NPR and 50+ others.

Other manuscripts (Reverse Chronological):

12. Chopade, P., Chopade, N., Zhao, Z., Mitragotri, S., Liao R.*, & **Chandran Suja, V.*** Alzheimer's and Parkinson's Disease Therapies in the Clinic (2023) *Bio-engineering and Translation Medicine* * Equal contribution, **Senior Author**
13. K. Adebawale*, R. Liao*, **V. Chandran Suja** et al, Materials for Cell Surface Engineering (2023). *Advanced Materials* doi:10.1002/adma.202210059. * Equal contribution
14. N Kapate, M. Dunne, N. Kumbhojkar, S. Prakash, L. Wang, A Graveline, K. S. Park, **V. Chandran Suja**, J. Goyal, J. R. Clegg, S. Mitragotri. A Backpack-based Myeloid Cell Therapy for Multiple sclerosis (2023). *Proceedings of the National Academy of Sciences*. 120(17), e2221535120.
15. S. Prakash, N. Kumbhojkar, A. Lu, N. Kapate, **V. Chandran Suja**, K. S. Park, L. Wang, S. Mitragotri. Polymer Micropatches as Natural Killer Cell Engagers for Tumor Therapy. (2023) *ACS Nano* doi:10.1021/acsnano.3c03980.
16. Brower*, D., Calhoun, S*., **Chandran Suja, V.**, Kim, G., Wang, N., Radzysinski, M. McCully, A., Fuller, G. G, Kusumaatmaja, H., & Fordyce, P. M. (2022) Systematic characterization of effect of flow rates and buffer compositions on double emulsion droplet volumes and stability *Lab on a Chip* doi:10.1039/D2LC00229A * Equal contribution
 - Featured in themed collection - Lab on a Chip HOT Articles 2022

17. Tsao, A.C., Parker, M.J., Lovich, M.A., **Chandran Suja, V.**, Deng, H., Houle, T., & Peterfreund, R.A.(2022) Initiation of an Emulsion Microinfusion: Flow Direction Influences Delivery Onset Rate. *Accepted European Journal of Pharmaceutical Sciences*
18. Huang, Y.*, Fuller, G. G. & **Chandran Suja, V.*** (2022) Physicochemical characteristics of Droplet Interface Bilayers *Adv. Colloids & Interface Science* 304, 102666 * Equal contribution, **Senior Author**
19. Huang, Y., **Chandran Suja, V.**, L Amirthalingam, & Fuller, G. G. (2022) Influence of Salt on the Formation and Separation of Droplet Interface Bilayers (2022) *Physics of Fluids*
 - Featured article in Physics of Fluids
20. **Chandran Suja, V.***, Verma, A.*, Mossige, E. J. L., Cui, K., Xia, V., Zhang, Y., Sinha, D., Joslin, S. & Fuller, G.G. (2022) Dewetting Characteristics of Contact Lenses coated with Wetting agents. *Journal of Colloid and Interface Science* 614, 24-32. * Equal contribution
21. **Chandran Suja, V.** (2022). Challenges in Mitigating Lubricant Foaming. *Lubricants*, 10(6), 108.
22. **Chandran Suja, V.**, Hadidi,A., Kannan, A., Chadwick, B.G.L. & Fuller, G. G. (2021). Axisymmetry breaking, chaos, and symmetry recovery in bubble film thickness profiles due to evaporation-induced Marangoni flows. *Physics of Fluids*, 33(1), 012112
 - Featured article in Physics of Fluids
23. Mossige, E.J*, **Chandran Suja, V.***, Walls, D.* & Fuller, G. G. (2021), Dynamics of Freely Suspended Drops Translating through Miscible Environments *Physics of Fluids* * Equal contribution
24. Huang, Y.*, **Chandran Suja, V.***, Tajuelo, J. & Fuller, G. G. (2021). Surface Energy and Separation Mechanics of Droplet Interface Phospholipid Bilayers. *J. R. Soc. Interface* 18: 20200860 * Equal contribution
25. Calhoun, S.G.K.C.*, **Chandran Suja, V.***, & Fuller, G. G. (2021) Foaming and antifoaming in non-aqueous liquids. *Current Opinion in Colloids & Interface Science* * Equal contribution
26. **Chandran Suja, V.**, M. Rodriguez-Hakim, J. Tajuelo & Fuller, G. G. (2020) Single bubble and drop techniques for characterizing foam and emulsion stability. *Adv. Colloids & Interface Science* doi:10.1016/j.cis.2020.102295
 - Trade Journal Coverage: Highlighted in Tribology and Lubrication Technology Magazine Feb 2021 (Author Dr. Neil Canter)
27. **Chandran Suja, V.**, Kar, A. & Fuller, G. G. (2020). Foam stability in filtered lubricants containing antifoams. *Journal of Colloid and Interface Science*, 567, 1-9.
 - Trade Journal Coverage: Highlighted in Tribology and Lubrication Technology Magazine May 2020 (Author Dr. Neil Canter)
28. **Chandran Suja, V.***, Kannan, A.*, Kubicka, B., Hadidi, A. & Fuller, G. G. (2020). Bubble coalescence at wormlike micellar solution-air interfaces. *Langmuir* doi:10.1021/acs.langmuir.0c01861 * Equal contribution
29. Mossige, E.J.*, **Chandran Suja, V.***, Wheeler, S. F. & Fuller, G. G. (2020). Evaporation driven Rayleigh-Taylor Instability in Aqueous Polymer Solutions. *Phil. Trans. R. Soc. A*, 378: 20190533 * Equal contribution
30. Vamsi Krishna, C.* , **Chandran Suja, V.***, Watton, P.N., Arakeri, J.H. & Gundiah, N. (2020). Shear Stress Rosettes Capture the Complex Flow Physics in Diseased Arteries. *Journal of Biomechanics*, 104(7), 109721. * Equal contribution
31. Kamkar, M., Bazazi, P., Kannan, A., **Chandran Suja, V.**, Hejazi, S.H. & Fuller, G.G. (2020). Polymetric-Nanofluids Stabilized Emulsions: Interfacial versus Bulk Rheology. *Journal of Colloid and Interface Science* 576, 252-263.

32. **Chandran Suja, V.**, Frostad, J. M. & Fuller, G. G. (2016). Impact of Compressibility on the Control of Bubble-Pressure Tensiometers. *Langmuir*, 32(46), 12031-12038.
33. Suresh Babu, A., **Chandran Suja, V.** & Vinay Reddy, C. (2014). Three dimensional trajectory optimization of a homing parafoil. *IFAC Proceedings*, 47(1), 847-854.

In progress:

34. Knudsen, A., Arney, E. A., Butterfield, R. D., Sims, N. M., **Chandran Suja, V.**, Peterfreund, R. A., How does pump-driven continuous delivery of a lipid emulsion compare to delivery of a saline solution? A laboratory study. *Submitted*
35. N. Kumbhojkar, **V. Chandran Suja** et al, Cyto-Adhesive Micro-Platforms for Neutrophil-Based Immunotherapy. *Under revision*
36. N. Kapate, R. Liao, **V. Chandran Suja** et al, Backpack-mediated anti-inflammatory macrophage cell therapy for the treatment of traumatic brain injury. *Submitted*
37. N. Kapate, **V. Chandran Suja** et al, Polymer Backpack-loaded Tissue Infiltrating Monocytes for Treating Cancer *Submitted*
38. S. G. K. Calhoun*, **Chandran Suja, V.***, et al, Antifoams in diesel fuels: thin liquid film dynamics and antifoam mechanisms. *Submitted* * Equal contribution

INVITED TALKS

1. Platform and methods for spatiotemporally resolved measurements of dynamic tear film thickness, **Alcon, Texas**, Feb 14, 2023.
2. Mechanistic insights into foam/emulsion stability through single bubble/drop experiments, **Lubrizol Corporation, Ohio**, June 5, 2019.
3. Bubbles on Capillaries: (i) The bubble shape hysteresis (ii) Single bubble coalescence experiments for developing foam resistant lubricants, **U.C Berkeley Fluids Seminar**, May 8, 2017.
4. Mechanistic Insights into Foaming in Lubricants using Dynamic Fluid-Film Interferometry, **STLE NorCal Meeting**, June 21, 2017.

PATENTS

1. **Chandran Suja, V.** & Fuller, G. G. Platform and methods for the use of hyperspectral imaging for dynamic thin film measurements. Filed Feb 2021 with application No: US 2021/0264582 A1, Granted: Feb 2023 (US11580631B2)
 - *Industrial/Clinical Translation:* Patented instruments acquired by Vision Care division of Johnson & Johnson for \$90,000 and undergoing in house clinical trials. The same instrument was also acquired by the Head, Surgical and Vision care research division of Alcon for a sum exceeding \$250K for end-user ophthalmic product development.
2. **Chandran Suja, V.** & Fuller, G. G. Fully Miscible Antifoam Formulations. Published Dec 2022 with International Patent No: WO2022251469A1
3. **Chandran Suja, V.**, Tandon, A., & Fuller, G. G. Platform and Methods for data-driven analysis of thin film interferograms. Provisional patent submitted.
4. **Chandran Suja, V.**, Detry, A., Sims, N., Arney, A., Peterfreund, R., & Mitragotri, S. Device and methods for managing multidrug delivery via infusion pumps. Provisional patent filed with Mass General Brigham Innovation Office.

SELECTED CONFERENCES AND POSTERS

- 2023 - *ACS Colloid & Surface Science Symposium, 97rd Annual Meeting*, Rayleigh, North Carolina, USA
- 2021 - *Society of Tribology and Lubrication Engineers Annual Meeting*, Orlando, Florida, USA
- 2021 - *Society of Rheology, 92nd Annual Meeting*, Bangor, Maine, USA
- 2021 - *American Institute of Chemical Engineers Annual Meeting*, Boston, Massachusetts, USA
- 2021 - *American Physical Society, Division of Fluid Dynamics, 74th Annual Meeting*, Phoenix, Arizona, USA
- 2020 - *International Congress of Rheology*, Rio de Janeiro, Brazil
- 2020 - *Society of Tribology and Lubrication Engineers Frontiers Conference*, Virtual Event
- 2020 - *American Institute of Chemical Engineers Annual Meeting*, Virtual Event
- 2020 - *American Physical Society, Division of Fluid Dynamics, 73rd Annual Meeting*, Virtual Event
- 2019 - *American Physical Society, Far West Section*, Stanford, California, USA
- 2019 - *American Institute of Chemical Engineers Annual Meeting*, Orlando, Florida, USA
- 2019 - *American Physical Society, Division of Fluid Dynamics, 72nd Annual Meeting*, Seattle, Washington, USA
- 2019 - *ACS Colloid & Surface Science Symposium, 93rd Annual Meeting*, Atlanta, Georgia, USA
- 2018 - *American Physical Society, Division of Fluid Dynamics, 71st Annual Meeting*, Atlanta, Georgia, USA
- 2018 - *ACS Colloid & Surface Science Symposium, 92nd Annual Meeting*, State College, Pennsylvania, USA
- 2018 - *e-Wear Conference, 2nd Annual Meeting*, Stanford, California, USA
- 2017 - *American Physical Society, Division of Fluid Dynamics, 70th Annual Meeting*, Denver, Colorado, USA
- 2017 - *Society of Rheology, 88th Annual Meeting*, Tampa, Florida, USA
- 2016 - *American Institute of Chemical Engineers Annual Meeting*, San Francisco, California, USA

STUDENT ADVISING

Individually supervised students over quarter-long and year-long research internships. Developed customized projects and provided mentorship to ensure strong understanding of concepts as well as successful completion of rigorous scholarly work.

* indicates co-authorship in peer-reviewed papers and conferences

Graduate Students

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| 1. John Belanger, Stanford | Jul, 2019 – <i>present</i> |
| 2. Yogi Huang, Stanford | Mar, 2020 – Jan, 2023 |
| 3. Suzanne Calhoun, Stanford | May, 2020 – June, 2023 |
| 4. Severin Bahman, ETH Zurich (currently at Zurich Insurance Company Ltd) | Aug, 2017 – Nov, 2017 |
| 5. Meiirbek Islamov*, Columbia University (currently PhD at U. Pittsburgh) | Jul, 2018 – Sep, 2018 |

Undergraduate Students

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| 1. Dania Villafuerte Gonzalez*, Harvard <i>Advisor for Honor's Thesis "Cellular backpack mechanics under flow"</i> | Sept, 2022 – April, 2023 |
| 2. Paola Carrillo Gonzalez, Harvard <i>Advisor for Honor's Thesis "A model system to evaluate macrophage migration in vitro"</i> | Jul, 2021 – April, 2022 |
| 3. Ignacio Blanco Jesus, Stanford <i>Advisor for Honor's Thesis "Dessication and dissolution instabilities of polymeric drops"</i> | Jul, 2019 – Jun, 2020 |
| 4. Archana Verma*, Stanford (currently PhD at UIUC) | Jul, 2019 – Apr, 2020 |
| 5. Dionne Thomas, Stanford | Jun, 2019 – Aug, 2019 |
| 6. Ao Chen, Zhejiang University (currently PhD at U. Wisconsin-Madison) | Jun, 2019 – Aug, 2019 |
| 7. Benjamin Chadwick*, Stanford | Jan, 2018 – Jun, 2018 |
| 8. Brian Edward Ly*, Stanford | Jan, 2018 – Jun, 2018 |
| 9. Finn Banks, Johns Hopkins | Jul, 2017 – Aug, 2017 |
| 10. Johnny Sentmanat*, Texas A&M (currently PhD at Georgia Tech) | Jun, 2018 – Aug, 2018 |

High School Students

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| 1. Pooja Chopade*, USA | Summer 2021 |
| 2. Neha Chopade*, USA | Summer 2021 |
| 3. Avni Gokarn, USA | Summer 2021 |
| 4. Indeera Pujar, USA | Summer 2021 |
| 5. Arnub Tandon, USA (currently undergrad at Stanford University) | Spring, Summer 2020 |
| 6. Bruce Zhang, China | Summer 2020 |
| 7. Ben Rubinstien, USA | Summer, Fall 2019 |
| 8. Aaron Lipp, USA | Summer 2019 |
| 9. Joshua Kim, USA | Summer 2019 |
| 10. Manas Tiwari, India (currently undergrad at U. Wisconsin-Madison) | Summer 2019 |
| 11. Alex Hadidi*, USA (currently undergrad at UCLA) | Summer 2018 |
| 12. Zachary Ernst*, USA | Summer 2018 |
| 13. Bruce Kubicka*, USA (currently undergrad at Cornell) | Summer 2017, 2016 |
| 14. Andrei Bielay, Canada | Summer 2017 |
| 15. Cole Gillespie, USA | Summer 2016 |
| 16. Mathilde Lettinga, Germany | Summer 2016 |

TEACHING EXPERIENCE

Teaching Assistant ChemEng 120A:Fluid Mechanics Winter 2018, Winter 2019

- Delivered guest lectures, developed home works and midterm exams.
- Started the 'Fluid Mechanics Video Lecture', which is currently in its third iteration.

Teaching Assistant Rheology Short Course in Beijing Summer 2019

- Invited to TA the short course on Rheology offered by Prof. Gerald Fuller at the Stanford Center at Peking University.
- Helped instruct a diverse international student cohort and provided guidance for their course presentations.

Mentor TA ChemE Department, Stanford 2019 - 2020

- Trained new TA's through holding orientation sessions and one on one discussions.

SERVICE AND OUTREACH

Journal Editor

- Journal of Visualized Experiments (Special Issue - Biointerfaces), Coatings (Special issue - Fluid Interfaces in Colloidal Systems: Aerosols, Foams, and Emulsions), Physics of Fluids.

Journal Reviewer

- Soft Matter, Langmuir, Journal of Colloids and Interface Science, Physical Review journals, Bioengineering & Translational Medicine, Physics of Fluids, Polymers, ACS Applied Materials, Materials, Royal Society Interface, Advances in Colloids and Interface Science

Topical Expert (Interfacial Science) Viewpoint Writer in APS Physics Magazine

- Provide expert commentary on latest scientific publications in interfacial science

Co-Founder, Medicine Engineering and Drug Innovation Stars (MEDISTars) program 2023

- Summer program by Harvard School of Engineering and Applied Sciences for introducing high schoolers to drug development and clinical trial process.

Co-Founder and Leader, CCS Mentoring 2019

- Initiative by the Catholic Community at Stanford (CCS) primarily aimed at connecting mentees with mentors who can provide a ‘big brother/sister’, academic, spiritual and business guidance.

Student Member, Chemical Engineering Faculty Search 2018, 2019

- Evaluated the research, mentoring and teaching philosophies of prospective faculty candidates.

Judge, Stanford Research Conference 2017, 2018

- Evaluated undergraduate research from around the country for scientific content, students’ thought processes and critical thinking.

Judge, AIChE Undergraduate Research Conference 2019

- Evaluated undergraduate research from around the country for scientific content, students’ thought processes and critical thinking.

REFERENCES

1. Prof. Gerald Fuller (ggf@stanford.edu)
2. Prof. Samir Mitragotri (mitragotri@seas.harvard.edu)
3. Prof. Abdul Barakat (barakat@ladhyx.polytechnique.fr)
4. Prof. Eric Shaqfeh (esgs@stanford.edu)
5. Prof. Jian Qin (jianq@stanford.edu)