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## ANUSHKA GUPTA

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### EDUCATION

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**University of California, Berkeley and University of California, San Francisco** August 2016 – present  
PhD, Graduate Program in Bioengineering | Research Advisor: Prof. Aaron Streets | GPA: 3.91/4

**Indian Institute of Technology Kharagpur (IIT Kharagpur), India** July 2011 – August 2016  
Master and Bachelor of Technology, Chemical Engineering | GPA: 9.12/10

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### RESEARCH INTERESTS

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Design and fabrication of integrated microfluidic circuits, nonlinear optical microscopy, single cell genomics

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### PUBLICATIONS

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B. A. Nestor, E. Samiei, R. Samanipour, **A. Gupta** et al., “Digital microfluidic platform for dielectrophoretic patterning of cells encapsulated in hydrogel droplets,” *RSC Adv.*, vol. 6, no. 62, pp. 57409–57416, Jun. 2016.

**A. Gupta** et al., “3D Cell Patterning using Dielectrophoresis on Digital Microfluidics”, *IEEE Engineering in Medicine and Biology Society (EMBS) Conference*, Milano, Italy, August 25th-29th, 2015

**A. Gupta** et al., “Ceria-based Nanocrystalline Oxide Catalysts: Synthesis, Characterization and Applications”, Book title: *Nanomaterials: Physical, Chemical, and Biological Applications*, *Apple Academic Press*, Pub Date: January 2017

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### AWARDS AND ACHIEVEMENTS

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- Ranked 2nd (among 90 undergraduates) in the department of Chemical Engineering, IIT Kharagpur 2011 – 2016
- Awarded Institute Blue for exceptional performance in academics and sports at IIT Kharagpur 2011 – 2016
- Offered Mitacs Globalink Research Fellowship in partnership with the Canadian government Summer 2015
- Offered financial assistantship to pursue Master’s thesis by Government of India 2015 – 2016
- Selected for Unilever’s Future Leader Program in Research and Development function 2016

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### GRADUATE RESEARCH EXPERIENCE

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**Streets Lab, UC Berkeley** May 2017 – present  
*Graduate Student Researcher | Advisor: Prof. Aaron Streets*

- Investigated the performance of a spectral detector in Olympus FV1200 for spontaneous Raman measurements on pure proteins, lipids and biological samples
- Differentiated 3T3-L1 cells to adipocytes using a chemical differentiation cocktail. Performing RNA extraction and subsequent RT-qPCR analysis along the differentiation timeline to understand key transcriptional changes in adipogenesis
- Performing fluorescence and coherent antistokes Raman scattering (CARS) imaging on bacterial biofilms to understand the difference between wild type and mutant listeria strain

**Fletcher Lab, UC Berkeley** Spring 2017  
*Graduate Student Researcher | Advisor: Prof. Daniel Fletcher*

- Investigated possible P14 viral-protein driven axonal fusion in PC12 cells derived differentiated neurons of peripheral commitment

**Herr Lab, UC Berkeley** Fall 2016  
*Graduate Student Researcher | Advisor: Prof. Amy Herr*

- Investigated methods to increase the sensitivity and resolution of the single-cell western blot assay

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### LEADERSHIP ACTIVITIES

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**Member, Logistics Committee, Expanding Your Horizon (EYH), University of California Berkeley** 2016-present

- Part of a 6-member committee responsible for logistical planning and implementation of a daylong conference, which serves to introduce middle school girls to female role models involved in STEM

**National Service Scheme Leader, IIT Kharagpur** 2011 – 2013  
*National Service Scheme, Ministry of Youth Affairs and Sports Govt. of India*

- Supervised a group of 25 NSS volunteers identifying the needs of the community, organized 10+ awareness rallies on social issues and taught a class of 30+ primary grade students of local schools
- Awarded with Certificate of Recognition for exhibiting excellent leadership and managerial skills

**Coordinator, Technology Robotix Society, IIT Kharagpur**

2011 – 2016

*Also served as Head (2013), Sub Head (2012) and Member (2011)*

- Coordinated a team of 31 people for successful organization of Robotix 2015, South Asia's largest robotics competition at IIT Kharagpur
- Organized workshops at the Birla industrial and Technological Museum and Ranchi Science Center for promoting the culture of robotics amongst 2000 + enthusiasts
- Mentored a group of 15+ students for successful completion of a 2-week long autonomous robotics project. Designed over 8 online 'Do It Yourself' tutorials for beginners in manual robotics

**Captain, Women's Badminton Team, IIT Kharagpur**

2014 – 2016

- Led the team to a gold winning campaign in Sports fest, IIT Roorkee, 2016
- Led the team to an efficacious silver winning campaign at 50th Inter IIT Sports meet, IIT Bombay
- Effectively managed logistics and communications between the team members and the student body of IIT Kharagpur

**WORK EXPERIENCE**

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**Hindustan Unilever Research Center**

May 2014 – July 2014

*Summer Intern, Refreshments category, Research and Development Function | Manager: Vivek Sistla*

- Assessed TESS Juice Intensification and Coating technologies for sensory enhancement of tea bags keeping boiled tea as the benchmark.
- Provided key inputs on tea manufacturing and processing line for Juice Intensification trials at Assam
- Prototyped coating technology and evaluated its performance in QDA, Speed of Infusion, Color Measurement using Chromometer and Expert Tasters Score

**UNDERGRADUATE PROJECT EXPERIENCE**

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**The University of British Columbia, Canada**

May 2015 – August 2015

*Visiting International Research Student | Advisor: Prof. Mina Hoorfar*

- Designed and fabricated a digital microfluidic platform using conventional photolithography process for patterning of cells using dielectrophoresis. Cultured Human Embryonic Kidney cells for experiments.
- Developed a MATLAB model for predicting the real part of Clausius–Mossotti factor for a range of useful frequencies for mammalian cells in 5% Gelatin Methacrylate prepolymer solution
- Designed and performed experiments for robust characterization of microfluidic platform's performance in cell trapping time, cell viability and cell island size.
- Fabricated a digital microfluidic platform for low concentration plasmid DNA detection (18ng/ul) using gravity driven hydrodynamic polystyrene beads separation

**Quantum and Molecular Engineering Laboratory (QMEL), IIT Kharagpur**

May 2014 - July 2016

*Bachelor and Master of Technology Dissertation | Advisor: Prof. Parag Arvind Deshpande*

- Studied and characterized the effects of Sn doped in CeO<sub>2</sub> (solid solution) by calculation of ensemble averaged energy using parallelized Monte Carlo Algorithm
- Assessed the level of time-varying degree of informational efficiency of stock price markets of BRIC countries using the Symbolic Time Series Analysis and the modified Shannon entropy
- Studied and characterized the effects of Boron doped in Buckminster fullerene on its structural and energy changes by performing Density Functional Theory (DFT) calculations

**Indian Institute of Technology Kharagpur**

July 2012 - September 2012

*Semester Project | Advisor: Prof. Sunando DasGupta*

- Studied surface modification of oxidized silicon wafer to a super hydrophobic bilayer of poly acrylic acid and poly allylamine hydrochloric acid for facilitating the movement of a water droplet towards a hotspot using electrowetting

**Indian Institute of Technology Roorkee**

May 2013 - July 2013

*Summer Internship | Advisor: Prof. Sunando DasGupta*

- Developed a model for the temperature profile in a microfluidic channel for the flow of a compressible fluid involving momentum and heat transfer at a constant input heat flux

**TEACHING AND MENTORSHIP EXPERIENCE**

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**Be A Scientist, University of California Berkeley**

October 2016 – December 2016

- Worked at the King Middle School in Berkeley to mentor 7th grade students in designing, carrying out, and reporting on their own individual scientific investigations
- Through this process I gained experience in science outreach, developing science communication skills, and inspiring the

next generation of scientists

**Undergraduate Teaching Assistant**, *Reaction Engineering Laboratory, IIT Kharagpur*

2015 - 2016

- Teaching assistant for class of 40+ students. Duties included tutoring, facilitating in experimentation during lab sections and grading exams

**Mentor**, *University of British Columbia*

Summer 2015

- Mentored 2 high school students in experimental planning and execution relevant to investigation at microscale at the Advanced Thermofluidic Laboratory, Summer 2015

## **COURSES**

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- Basic Principles of Drug Delivery (BioE 224), Polymer Surfaces and Interfaces (Mat Sci 251), Advanced BioMEMS and Bionanotechnology (BioE 221), Practical Light Microscopy (BioE 168L), Cell and Tissue Mechanotransduction (BioE 211)

## **SKILLS AND TECHNIQUES**

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- Python, MATLAB, C
- Senior user at a class 100 clean-room with experience in multilayer microscale chip fabrication. Operated Plasma Etcher, Sputtering Machine, Spin Coater, UV Exposer and Development Machine and Parylene C Coater
- RNA isolation and purification, Immunocytochemistry, RT-qPCR, primer design, transfections, transductions, gel electrophoresis, western blots, photolithography, sterile technique, yeast and mammalian cell culture
- Confocal, TIRF, fluorescent, phase contrast and nonlinear optical microscopy techniques