BIOGRAPHICAL SKETCH

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NAME: Prakash, Manu

eRA COMMONS USER NAME (credential, e.g., agency login): PRAKASH.MANU

POSITION TITLE: Associate Professor

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.)*

INSTITUTION AND LOCATION	DEGREE *(if applicable)*	Completion Date MM/YYYY	FIELD OF STUDY
Indian Institute of Technology, Kanpur, UP India	B. Tech	06/2002	Computer Science
Massachusetts Institute of Technology, MA	Ph. D.	09/2008	Applied Physics
Harvard Society of Fellows, Boston MA	Junior Fellow	06/2011	Biophysics/Applied Physics

A. Personal Statement

The focus of my lab is two-fold: to apply cellular and physical biology-based approaches to problems in organismic biophysics and develop novel tools for measurements in biological systems. We also apply ideasfrom theoretical soft-condensed matter physics to understand material properties of active living systems. Future developments in microscopy and in particular SEM are a natural extension of my work actively seeking to improve accessibility of microscopy at all levels to scientists in a multitude of settings. One of the current themes in my lab is to develop new microscopy mechanisms involving novel approaches to how such devices are constructed. Broadly, we invent new tools for studying non-model organisms with significant focus on life in the ocean - addressing fundamental questions of cell biology in context of its ecology. My lab is dedicated towards inventing, building and scaling-up “frugal science” tools to democratize access to science such as Foldscope, diagnostics of deadly diseases like malaria and convening global citizen science communities to tackle planetary scale environmental challenges such as mosquito or plankton surveillance by citizen sailors mapping the ocean in the age of Anthropocene.

B. Positions, Scientific Appointments, and Honors

Positions and Employment

2000-2002 Undergraduate Student Researcher at Center for Robotics, Indian Institute of Technology, Kanpur (India)
2002-2008 Graduate Student Researcher with Neil Gershenfeld, Massachusetts Institute of Technology
2008-2011 Junior Fellow, Harvard Society of Fellows
2011- Assistant Professor, Department of Bioengineering, Stanford University
2012- Member, Biophysics Program
2015- Senior Fellow, Center for Innovation in Global Health
Member, Woods Institute of the Environment
Faculty Fellow, Chemistry, Engineering and Medicine (ChEM-H)
2018- Associate Professor, Department of Bioengineering, Stanford University

Other Experience and Professional Memberships

2004- American Physical Society
2011- American Society of Cell Biology
2013-2018 Member, Undergraduate Curriculum Committee, Department of Bioengineering, Stanford University
2016- Co-founder, Board Member, Foldscope Instruments
2017- Member, Plankton Planet

2017- Co-author, Introductory Biology textbook “Explorers guide to life”
2017- Board Member, PIVOT, Madagascar
2017- Board Member, Ciencia Puerto Rico, Puerto Rico
2017- Board Member, Jasper Ridge Core Leadership Team, Center for Innovation in Global Health
2018 Scientific Advisory Board Fédération de Recherche’ (CNRS FR) TO SEE - Tara Oceans System Ecology & Evolution

Honors

1998-1999 Director’s Meritorious Student Award
2006 MIT 100k Development Prize Runners
2006 Boeing Sustainability Prize, MIT Ideas Award
2008 Lemelson-MIT Student Prize Finalist
2008-2011 Harvard University William F. Milton Fund Award
2011 TED Senior Fellow
2011 Terman Fellow, Stanford
2011 mHealth Alliance Innovation Award, United Nations Foundation
2011 APS DFD Gallery of Fluids Motion Award
2011 Vodafone Wireless Innovation Award
2011 Gates Foundation Explorations Award
2011-2012 Baxter Foundation Junior Faculty Award
2013-2016 Ellison Young Faculty Award (declined)
2013 APS DFD Gallery of Fluids Motion Award
2013-2017 Pew Scholar
2013 India Abroad Face of the Future Award
2014 Gates Foundation Explorations Award
2014 Invited Member, First White House Maker Faire
2014 Winner, Society for Science and the Public 21st Century Chemistry Set Competition
2014 Popular Science Brilliant Top 10 Award
2014 TR35 MIT Technology Review
2014 NSF Career Award
2014 NIH Directors New Innovator Award
2014 National Geographic Emerging Explorer
2016-2018 HHMI-Gates Fellow
2016 MacArthur Fellow
2016 WIRED’s Next List
2017 Popular Science/NSF
2017-2022 Chan Zuckerberg BioHub Investigator
2017 Tau Beta Pi Teaching Award
2017 INDEX Design Award
2018 HHMI Investigator Competition, Semi-finalist
2018 Inaugural LInC Fellow
2018 Beazley Design of the Year Award (Paperfuge)
2019 Newsweek The Creative Class of 2019
2020 Microbiology Society’s Unilever Colworth Prize
2020 Rotary International STAR Humanitarian Award for Contributions to Science, Technology, and Robotics

C. Contributions to Science

1. My publications in physical biology bring tools from applied mathematics to novel questions in biology, at organismic and cellular scale. Physical mechanisms elucidated in these papers play afundamental role in biological processes, including several active systems. This work takes a combined experimental and analytical approach to tackle each one of the problems.
   a. Coyle, S.M., Flaum E.M., Li, H., Krishnamurthy, D., Prakash, M. Coupled Active SystemsEncode an Emergent Hunting Behavior in the Unicellular Predator

Lacrymaria olor.
Current biology: CB, 2019

b. *Krishnamurthy, D., Katsikis, G., Bhargava, A., and Prakash, M.* Schistosoma mansoni cercariaeexploit an elastohydrodynamic coupling to swim efficiently arXiv:1605.04041 accepted in **Nature Physics.** Sep 2016

c. Dumont S and Prakash M., Emergent Mechanics of Biological Structures *Molecular Biologyofthe Cell* Vol. 25 no. 22 3461-3465, 2014

d. Prakash M., Quere D., and Bush J., Surface tension transport of prey by feeding shorebirds: Thecapillary ratchet *Science*, Vol. 320 (5878), 931-934 (2008)

2. My publications in the field of frugal science:
   a. *Bhamla, M.S., Benson, B., Chai, C., Katsikis, G., Johri, A., and Prakash* M. Paperfuge: An ultra-lowcost, hand-powered centrifuge inspired by the mechanics of a whirligig toy **BioRxiv** doi: http://dx.doi.org/10.1101/072207 Sep 2016
   b. Cybulski, J., Clements, J. and Prakash, M., Foldscope: Origami based paper microscope *PLoS ONE* 9(6):e98781. doi:10.1371/journal.pone.0098781, June 2014
   c. Ephraim, R.K.D., Duah ,E., Cybulski, J.S., Prakash, M., D'Ambrosio, M.V., Fletcher, D.A., Keiser, J.,Andrews, J.R. and Bogoch, I.I., Diagnosis of Schistosoma haematobium Infection with a Mobile Phone- Mounted Foldscope and a Reversed-Lens CellScope in Ghana *American Journal of TropicalMedicine and Hygiene*, Vol. 14-0741, 2015
3. My publications in physics of computation:
   a. Gilpin, W., Bull, M.S., Prakash, M. The multiscale physics of cilia and flagella *Nature Physics Review*, 2020; 2: 74-88
   b. Mathijssen, A.J., Culver, J., Bhamla, M.S., Prakash, M. Collective intercellular communication through ultra-fast hydrodynamic trigger waves *Nature*, 2019
   c. Katsikis, G., Cybulski, J.S. and Prakash, M., Sychronous Universal Droplet Logic and Control *NaturePhysics*, Vol. 11, 588-596, 2015
   d. Prakash, M., Gershenfeld, N., Microfluidic Bubble Logic *Science* Vol. 315, 832-835, 2007
4. My publications in the field of active matter:
   a. Cira, N., Benusiglio, A. and Prakash, M., Vapor mediated sensing and motility in two- component droplets *Nature* Vol. 519, 446-450, 2015

Complete List of Published Work in MyBibliography:
http://www.ncbi.nlm.nih.gov/myncbi/collections/bibliography/49563306/?reload=editSuccess