



Aditya Iyer

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**Research Interests:** Neuroethology, Engineering, Conservation

## EDUCATION

**BSc - MSc**

(Bachelor of Science-Master of Science)

**Indian Institute of Science, Bangalore**

(CGPA 7 / 8)

**Aug 2015 - Present**

(Expected: Apr 2020)

*Relevant Coursework: Animal Behavior, Systems and Cognitive Neuroscience, Molecular and Cellular Neuroscience, Algorithms and Programming, Introductory Physics, Thermodynamics, Statistical Mechanics, Biological Physics*

## SCHOLARSHIPS

<b>1 Khorana Scholarship</b>	<ul style="list-style-type: none"><li>• Indo-US Science and Technology Forum</li><li>• Dept. of Science and Technology, India</li></ul>	<b>2018</b>
The Khorana Scholarship provides opportunities to junior Indian students to participate in short term research projects at leading universities in the US. This scholarship funded my internship at the O'Connell Lab at Stanford University.		
<b>2 Kishore Vaigyanik Protsahan Yojana Scholarship</b>	<ul style="list-style-type: none"><li>• Dept. of Science and Technology, India</li></ul>	<b>2015-20</b>
The KVPY is an ongoing National Program of Fellowship in basic sciences to motivate careers in science. This scholarship is funding my Undergraduate program at the Indian Institute of Science, Bangalore.		

## RESEARCH EXPERIENCE

<b>1 Probing the Physical Basis of Metabolism</b>	<b>Prof. Shashi Thutupalli (NCBS)</b>	<b>August 2019-Present</b>
Metabolic rates are being measured in yeast snowflakes, a system spanning 6 orders of magnitude in mass. This study aims to provide a first principle framework to explain the scaling of metabolic rates with mass (Kleiber's Law). <i>Microfluidic tools, basic molecular biology, image analysis, mathematical modelling</i> are being used.		
<b>2 Effect of haltere inputs on wing kinetic parameters in soldierflies</b>	<b>Prof. Sanjay Sane (NCBS)</b>	<b>October 2018 May 2019</b>
Using <i>High Speed Videography</i> , I studied the role of halteres on wing kinetic parameters and control of soldier-flies, in free flight. I used a deep-learning tool, DeepLabCut, interfacing it with another tracking software, DLTdv7 for reliable markerless <i>3D pose estimation</i> and <i>quantification of behaviour</i> .		
<b>3 Dietary Tuning &amp; Begging in mimic poison frog tadpoles</b>	<b>Prof. Lauren O'Connell (Biology, Stanford)</b>	<b>May 2018 July 2018</b>
I performed <i>RNA Extractions</i> of whole tissues, <i>immunohistochemical stains</i> and <i>fluorescence confocal microscopy</i> on brain sections to study the neural basis fo begging behaviour in <i>R. Imitator poison frog tadpoles</i> . I learnt to <i>operate a cryostat</i> and made 10µm thin brain sections for over 35 tadpole brains. I was actively involved in frog and tadpole care. I also set up rigs for quantifying begging behaviour in a controlled setting.		
<b>4 iFLOAT : Gas Vesicles for Protein Purification (iGEM 2017 - IISc UG Team)</b>	<b>Prof. Dipshikha Chakravorty (MCBL, IISc)</b>	<b>March 2017 November 2017</b>
This multidisciplinary team effort to implement gas vesicles to aid protein purification was awarded a Gold medal at iGEM 2017. Working on this project gave me exposure to <i>basic molecular biology techniques</i> , writing research proposals, <i>coordinating with the administration</i> , and <i>crowdsourcing money for a project</i> . DBT India (Department of Biotechnology) funded Rs. 10,00,000 (~USD 14,300) for this project. We also raised Rs. 1,58,000 through crowd sourcing.		
<b>5 Identification of the Trail Pheromone of <i>Oecophylla smaragdina</i></b>	<b>Prof. Raghavendra Gadagkar (CES, IISc)</b>	<b>November 2016 December 2016</b>
During the course of this project, I learned various analytical chemistry methods like <i>TLC, GC/MS, IR/UV Spectroscopy, and NMR</i> , along with methods of organic synthesis, and the intricacies of <i>ant dissections</i> . I interacted with Prof. Hölldobler, (one of the world's leading myrmecologist) for his inputs on this project. I found evidence that the rectal gland could be the source for at least one component of the trail pheromone. I also <i>wrote a Swift Program</i> to track spatial locations of ant colonies within the campus of IISc.		

## COURSE PROJECTS

1	<b>Evolutionary Games on Graphs</b>	<b>Game Theory and Mechanism Design (Fall 2018)</b>	<b>March - April 2018</b>
	* Game Theoretical Application on Evolving Graphs * Simulations designed in Python 2.7		
2	<b>Density Dependence on Aggression in <i>Oecophylla smaragdina</i></b>	<b>Animal Behaviour (Fall 2017)</b>	<b>Nov - Dec 2017</b>
	* Basic Behavioural Experiment Design and Implementation * Data Analysis in R		
3	<b>Dynamics of Pollinator Flower Interactions</b>	<b>Plant Animal Interactions (Fall 2017)</b>	<b>Nov - Dec 2017</b>
	* Simulations for pollinator-flower interactions in Python 3.0		
4	<b>Interhelical Packing in Collagen</b>	<b>Structural Biology (Spring 2017)</b>	<b>February - April 2018</b>
	* Python script for 2D mercaptor projections for a helix from a PDB file * Comprehensive literature review on collagens		

## WORKSHOPS & CAMPS

1	Computational Approaches to Memory and Plasticity (CAMP)	National Center for Biological Sciences	July 2019
2	Insect Multisensory Integration Workshop	National Center for Biological Sciences	June 2019
3	In House Flow Cytometry Workshop	Indian Institute of Science, Bangalore	August 2017
4	Madhava Mathematics Nurture Camp	Indian Statistical Institute, Bangalore	June 2017
5	Course on Creativity and Innovation	Indian Institute of Technology, Delhi (IFEHE)	June 2016
6	Vijyoshi: National Science Camp	Indian Institute of Science, Bangalore	December 2015
7	TIFR Public Outreach Program	Tata Institute of Fundamental Research, Mumbai	October 2013

## PRESENTATIONS

1	Halteres and Control of Dipteran flight	IISc UG Biology 2019	Bachelors Thesis	April 2019
2	L Form Bacteria	The Naturalists, IISc	IISc UG Biology Club	August 2018
3	Dietary Tuning of Infant Social Communication	O'Connell Lab, Stanford	Lab Presentation	August 2018
4	Sensing and Aging	Molecular Basis of Aging and Regeneration (Spring, 2018)	Course Presentation	April 2018
5	Effect of Ampicillin on M13 Bacteriophage Proliferation in <i>E. coli</i>	Roy Lab, IISc	Lab Presentation	August 2017
6	Light Pollution and Ecosystem Services	Plant Animal Interactions (Fall 2017)	Course Presentation	December 2017
7	Femtosecond Reaction Dynamics	Optical Spectroscopy (Spring 2017)	Course Presentation	April 2017
8	Interhelical Packing in Collagen	Structural Biology (Fall 2017)	Course Presentation	April 2017

## POSTERS

1	Evolutionary Games on Graphs	Game Theory and Mechanism Design (Fall 2018)	April 2018
2	iFLOAT: Gas Vesicles for Protein Purification	iGEM Conference 2017, Boston, MA	October 2017

## OUTREACH

1	Science Gallery Pop Up Exhibition	MG Road Metro Station, Bangalore	October 2019
2	NightLife	California Academy of Sciences, San Francisco	July 2018
3	Open Day, 2018	IISc, Bangalore	Mar 2018
4	Vijyoshi National Science Camp 2017	IISc Bangalore	Dec 2017
5	Notebook Drive	IISc, Bangalore	August 2017
6	Vijyoshi National Science Camp 2016	IISc, Bangalore	Dec 2016

## VOLUNTEERING

1	Student Conference on Conservation Science	IISc Bangalore	2019, 2018, 2017
2	Pravega (IISc UG Annual Fest)	IISc, Bangalore	2018, 2017, 2016

## OTHER SKILLS

1	Languages	English, Hindi, Tamil, Marathi
2	Programming Languages and Software	Python, Matlab, R, C, C++, LaTeX