

# CHAKRADHAR RANGI

## CONTACT

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Date of Birth: April 18th, 1997

## EDUCATION

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### BS-MS Dual Degree, Major in Physics

Indian Institute of Science Education and Research(IISER)  
Bhopal, Madhya Pradesh, India

May 2020

Grade Point: 8.59/10

### 12th Grade

Kendriya Vidyalaya RWF, Bangalore, India  
Central Board of Secondary Education

May 2015

Percentage: 95.6

Physics: 95/100

### 10th Grade

Kendriya Vidyalaya RWF, Bangalore, India  
Central Board of Secondary Education

May 2013

CGPA: 10.0/10.0

Physics: 10.0/10.0

## INTERNSHIPS AND PROJECTS

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### MS Thesis

Indian Institute of Science Education and Research Bhopal, India

August 2019 - Present

**Title:** Development of a Python code for modelling Trajectory Surface Hopping on Ab Initio Potential Energy Surfaces.

**Supervisor:** Dr. Varadharajan Srinivasan, Associate Professor, IISER Bhopal

- The project aimed at developing a highly efficient python wrapper for Time-Dependent Density Functional theory based Trajectory Surface Hopping algorithm on top of an electronic structure calculation package 'NWChem' to simulate Non-Adiabatic Dynamics for large molecular systems.

**Skills achieved:** Many advanced concepts in Electronic Structure theory, atomic & molecular physics, time-dependent quantum mechanics, large scale computing.

### Summer Internship

Jawaharlal Nehru Centre for Advanced Scientific Research(JNCASR),  
Bangalore, India

May 2019 - July 2019

**Title:** Time evolution of Kitaev-Chain under piece-wise noise using Transfer Matrix Method.

**Supervisor:** Dr. Vidhyadhiraja N.S., Associate Professor, JNCASR

- The project aimed at understanding the decoherence/revival of Majorana zero modes(MZMs) in a Kitaev Chain subjected to a piecewise noise with amplitude that retains in the same topological/trivial phase by calculating the Loschmidt Echo using Transfer Matrix Method.

**Skills achieved:** Got introduced to topics including graduate quantum mechanics, Topological phases and Dynamical quantum phase transitions.

### Summer Internship

Indian Institute of Science Education and Research Bhopal, India

May 2018 - July 2018

**Title:** Machine Learning for applications in Physics

**Supervisor:** Dr. Nirmal Ganguli, Assistant Professor, IISER Bhopal

- The project aimed at understanding Machine learning algorithms such as Neural Networks and its practical implementations using popular libraries such as Keras and PyTorch. To realise its application in physics, I attempted to reproduce the work of Self-Learning Monte Carlo on 2D Ising Model system.

**Skills achieved:** Basics of Machine Learning, Various algorithms in Machine learning including Multivariate Regression, Classification and Neural Networks, Self-Learning Monte Carlo method.

## TEACHING EXPERIENCE

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**Teaching Assistant, Introduction to Programming, EECS102** Jan 2018 - April 2018  
IISER Bhopal

- Worked as a Teaching assistant for an introductory course on programming in C offered by the department of Electrical engineering & Computer Science(EECS) for the freshman at IISER Bhopal.

**Teacher, Early Bird Physics Program** March 2018 - August 2018  
Cheenta Ganit Kendra(Online Platform)

- Was part of the teaching community at Cheenta Ganit Kendra, an online platform for young and motivated high-school students.

## EXTRA CURRICULAR ACTIVITIES

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**Secretary, Sports Council** March 2018 - March 2019  
Student Activity Council, IISER Bhopal

**Captain, IISER Bhopal Sports Team** December 2018  
Inter IISER Sports Competition(IISM) 2018, Bhubhaneswar, India

**Cricket Coordinator, Sports Council** January 2016-December 2017  
Sports Council, IISER Bhopal

**Member, Organising Committee** January 2018  
Enthuzia 18, Cultural Festival of IISER Bhopal

**Member, Organising Committee** Jan 2017 - Dec 2017  
Student Astronomy Club, IISER Bhopal

## SKILLS

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<b>Computing</b>	Python, C, C++, Git, LaTeX, HTML
<b>Libraries &amp; Tool</b>	Numpy, Matplotlib, PyTorch, Keras, VPython, QuTiP
<b>Operating System</b>	Linux, Windows
<b>Interpersonal Skills</b>	Leadership, Event Management, Knowledge sharing, Mentoring

## AWARDS AND ACHIEVEMENTS

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**Silver Medal, Cricket** December 2018  
Inter IISER Sports  
Meet held at Bhubhaneswar, India.

**IISM Championship Trophy** December 2018  
Led the IISER Bhopal Sports team to victory at Inter IISER Sports  
Meet held at Bhubhaneswar, India.

**Certificate of Appreciation**

2016 &amp; 2017

from the Student Senate for my contribution as Cricket Coordinator,  
Sports Council, IISER Bhopal

**Innovation in Science Pursuit for Inspired Research (INSPIRE) Fellowship**

August 2015

Department of Science and Technology, Government of India

**Certificate of Merit**

August 2015

Top 1.5% of Kendriya Vidyalaya Sangathan(1225 Schools across India)  
Students in the 12th grade examination conducted by Central Board  
of Secondary Education, India.

**CONFERENCES ATTENDED**

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**QMAT, 2nd Annual Conference on Quantum Condensed Matter**

July 2019

Indian Institute of Science, Bangalore, India

**SUMMER SCHOOLS ATTENDED**

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**Light and Beyond**

June 2020

International Center for Theoretical Sciences, Bangalore, India