

## SAI VIJAY BHASKAR MOCHERLA

M.S. in Chemistry,  
University of Rochester.

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### EDUCATION

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| <b>M.S. in Chemistry</b><br>University of Rochester, USA<br>CGPA: 3.72/4.00 (Theoretical Chemistry)  | <b>August 2020</b> |
| <b>M.Sc. in Chemistry</b><br>Sri Sathya Sai Institute of Higher Learning (SSSIHL), Prasanthi Nilayam, India<br>CGPA: 8.2/10.00 <u>Thesis:</u> Effect of Torsional Disorder on Exciton Migration in Conjugated Polymers | <b>April 2019</b>  |
| <b>B.Sc. (Hons.) in Chemistry</b><br>Sri Sathya Sai Institute of Higher Learning (SSSIHL), Bangalore, India<br>CGPA: 7.3/10.0      (Major's CGPA: 7.65/10.0)   | <b>April 2016</b>  |
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### RESEARCH EXPERIENCE

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| <b>Summer Research Project, University of Rochester</b><br><u>Advisor:</u> Prof. Andrew Jordan, Department of Physics and Astronomy<br>- Studied time-dependent Ginzburg-Landau models to understand vortex transport and low-temperature physics of Vortex-matter phases in Type-II Superconductors for quantum refrigeration applications.  | <b>05/2020 - 08/2020</b> |
| <b>Research Intern, Indian Institute of Science, Bangalore</b><br><u>Advisor:</u> Prof. Upendra Harbola, Department of Inorganic and Physical Chemistry (IPC)<br>- Modeled transport of quasiparticles in nano materials using different Random-walk mechanisms   | <b>05/2019 - 07/2019</b> |
| <b>M.Sc. Research Project, Sri Sathya Sai Institute of Higher Learning, India</b><br>- Developed a theoretical model of an exciton coupled to torsional modes of a polymer subunit to study the effects of torsional disorder on exciton transport in conjugated polymers.<br>- Numerically evaluated disorder-averaged intramolecular exciton migration rates were found to scale inversely with the increasing length of the polymer chain.<br>- Built numerical routines to simulate the quantum dynamics and explored the implementation of Tensor Network methods (based on DMRG) to handle quantum entanglement with increasing systems size.   | <b>08/2018 - 02/2019</b> |
| <b>Summer Research Fellow, Tata Institute of Fundamental Research, Mumbai</b><br><u>Advisor:</u> Prof. Venu Gopal Achanta, Department of Condensed Matter Physics and Material Science<br>- Worked on design of optical nanostructures with dispersion-less plasmon modes, and their fabrication on gold thin films using e-beam lithography and other cleanroom techniques.<br>- Studied the emergence of broadband optical transmission in these 'plasmonic quasi-crystals' using angle-resolved optical transmission measurements.<br>- Assisted in setting up the multi-color pump-probe spectroscopy apparatus to further measure the lifetimes of charge carriers (hot electrons) in fabricated optical nanostructures. | <b>04/2018 - 06/2018</b> |
| <b>Research Intern, Sri Sathya Sai Institute of Higher Learning, India</b><br><u>Advisor:</u> Prof. Sai Sathish Ramamurthy, Department of Chemistry<br>- Worked on fabrication nano-gratings made up polymer thin films by using Fracture induced structuring (FIS) for surface-plasmon enhanced fluorescence sensing applications.   | <b>11/2017 - 02/2018</b> |
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## SKILLS

**Programming and Software:** Python and Mathematica.

- Packages in Python: Numpy, SciPy, Pandas, Scikit-learn, Matplotlib, SymPy.
- Illustration and Graphics: Blender and Adobe Creative Cloud.

**Nano Fab:**

- Trained in design and fabrication of optical nanostructures using e-beam lithography.
- Skilled in wet chemistry and clean room techniques, including thin-film deposition, sputtering, etching.

**Computational:**

- Working proficiency with Ab initio packages such as Gaussian, GAMESS and Quantum Espresso.

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## TEACHING EXPERIENCE

**Teaching Assistant, Department of Chemistry, University of Rochester**

**08/2019 - 04/2020**

- Organised and supervised lab sessions for freshman General Chemistry(CHEM-131L) in fall '19
- Led problem solving and workshop for undergraduate and graduate students taking the course : Physical Chemistry-II : Thermodynamics and Statistical Mechanics (CHEM-252).

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## ACADEMIC ACHIEVEMENTS

- Qualified the 'IIT JEE Mains' in 2013 within the top 90 percentile (a National-level entrance test for undergraduate admissions in Science and Engineering).
- Qualified the IIT JAM, Chemistry in 2017 and GATE Chemistry in 2019 within 95 percentile. (National-level entrance tests for masters and Ph.D. admissions).

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## LEADERSHIP AND COMMUNITY SERVICE

- Served, organised and led various initiatives as a part of the Sri Sathya Sai Grama Seva, a village service project with a sustainable impact on ~150 villages in the state of Andhra Pradesh, India.
- Managed the operations of co-operative society stores on the University campus that on an average served the needs of ~350 students and the local community.
- Undergraduate Student coordinator for cultural events at Sri Sathya Sai Institute of Higher Learning.
- Volunteered to teach at local schools after my Bachelors through the Sri Sathya Sai Vidya Vahini Program.
- Handled video editing, photography and graphic design in the University multimedia team.

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## SOME RELEVANT COURSEWORK

- **MATHEMATICS:** Multivariable Calculus, Vector Analysis, Theory of Probability, Theory of Ordinary and Partial Differential Equations, Linear Algebra and Boundary Value Problem
- **PHYSICS:**  
Graduate Level Courses: (at University of Rochester) Quantum Mechanics, Mathematical Methods for Physics and Optics, Quantum Optics, Quantum Dynamics, Statistical Mechanics, Modern Statistics and Data Exploration in Physics.  
Undergraduate Courses: Classical Mechanics, Electricity and Magnetism, Electronics, Optics.
- **CHEMISTRY:**  
Masters Courses: Advanced aspects of Physical Chemistry, Quantum Chemistry, Thermodynamics and Statistical Mechanics, Computational Chemistry, Molecular Spectroscopy, Advanced aspects of Group Theory, Polymers Chemistry, Bio-Catalysis, Organic Structure and Stereochemistry  
Undergraduate Courses: Fundamentals of Theoretical chemistry, Physical Chemistry, Inorganic Chemistry, Organic Chemistry and Biochemistry