

# Ari Pereira

[f20180946@goa.bits-pilani.ac.in](mailto:f20180946@goa.bits-pilani.ac.in) | [LinkedIn](#) | [aripereira.github.io](https://aripereira.github.io)

## SUMMARY

---

I'm broadly interested in quantum chemistry and quantum systems. Specifically, the study of decoherence effects in quantum-classical systems and its applications in quantum computing.

## EDUCATION

---

**Birla Institute of Technology and Science, Pilani - Goa Campus** 2018 – 2023 (expected)  
*Dual Degree - M.Sc (Hons.) Chemistry, B.E (Hons.) Electrical and Electronics Engineering* Goa, IN  
*Current CGPA: 7.46*

## EXPERIENCE

---

**Institut de Chimie Physique, Université Paris-Saclay** Orsay, FR  
*MSc Thesis in Chemistry* June 2022 – Present  

- Working on coupled trajectory methods based on the exact factorization for non-adiabatic dynamics in the group of Prof. Federica Agostini.

**Institut de Chimie Physique, Université Paris-Saclay** Orsay, FR (remote)  
*Summer Internship* May 2021 – July 2021  

- Worked on ultra-fast non-adiabatic dynamics with Prof. Federica Agostini
- Compared the quantum decoherence effects of Coupled Trajectory Mixed Quantum-Classical algorithm with Surface Hopping and exact calculations for a variety of systems.
- A second line of work was accounting for a classical laser field explicitly in the simulations to simulate both the excitation and the dynamics after scattering.

**Süd-Chemie India Pvt. Ltd.** Vadodara, IN  
*Summer Internship* May – June 2020  

- Explored analytical tools to study catalytic converters.
- Proposed using XANES, EXAFS and XPS to study their oxidation state and structure.
- Worked under Dr Joseph Raj, Chief Manager R&D.

## PROJECTS

---

**Molecular Dynamics of model polymers** | *Supervisor: Prof R.N Behera* August 2021 – May 2022  

- Performed molecular dynamics simulations using the ESPResSo software package.
- Studied aggregation behaviour of a model nano-particle as well as the effect of varying chain length in a model polymer.

**Solutions to the Ornstein-Zernike Equation** | *Supervisor: Prof R.N Behera* Jan 2020 – June 2020  

- The project covered an introduction to statistical mechanics.
- Studied different methods to solving an integral equation for ideal liquids.
- Studied two closure relations: the Percus-Yevick approximation, and the Hypernetted-chain equation.

**Field Effect Transistor based Biosensors** | *Supervisor: Dr Gautam Bacher* August 2021 – December 2021  

- Studied different FET configurations for use in biosensors.
- Compared different gate and bio-receptor materials.

## SELECTED COURSEWORK

---

**Chemistry:** Introduction to Quantum Chemistry, Quantum Chemistry and Group Theory, Chemical Kinetics and Liquid Theory, Thermodynamics, Instrumental Methods of Analysis, Inorganic Chemistry I, II & III, Organic Chemistry I, II, III & IV

**Mathematics:** Probability and Statistics, Ordinary Differential Equations, Linear Algebra and Complex Variables, Vector Calculus, Optimization

**Physics:** Electromagnetic Theory, Mechanics Oscillations and Waves

**Engineering:** Computer Programming, Power Electronics, Digital Image Processing, Mobile Telecommunication Networks, Analog Electronics, Analog and Digital VLSI Design, Communication Systems, Digital Design, Control Systems, Microelectronics, Medical Instrumentation

## TECHNICAL SKILLS

---

**Languages:** Fortran, Python, C/C++, LaTeX, Bash

**Algorithms:** CT-MQC, FSSH, Ehrenfast, Exact Dynamics

**Instrumentation:** FTIR, UV-Vis spectrophotometer, XRD, NMR, Analog Electronics Laboratory

## PERSONAL INFORMATION

---

**Indian Citizen**

**Languages:** English(native), Hindi, French(basic), Konkani(basic)