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EDUCATION

- **Weizmann Institute of Science, Rehovot, Israel** 2021-
MSc Physics Percentage: 93.5
- **Indian Institute of Technology Bombay, Mumbai, India** 2018-2021
MSc Energy Science and Engineering CPI: 9.42
- **Loyola College, Chennai, India** 2015-2018
BSc Physics CGPA/Percentage: 9.09

RESEARCH EXPERIENCE

- **Weizmann Institute of Science (WIS)** 2022-
Masters Project under the supervision of Prof. Yosef Nir
 - Studied various BSM frameworks
 - Constrained parameters in a couple of BSM frameworks using data from LHC
- **Indian Institute of Technology Bombay (IITB)** 2020-2021
Masters Project under the supervision of Prof. Karthik Sasihithlu and Prof. M. P. Gururajan
 - Conducted literature survey of near-field heat transfer and studied its mechanism
 - Performed molecular dynamics simulation of near-field heat transfer across two nanospheres using LAMMPS

RESEARCH INTERESTS

My research interests lie in theoretical physics (particularly particle physics/condensed matter). In the future, I would like to infuse computational methods like deep learning, tensor networks and quantum computing in my projects.

TECHNICAL SKILLS AND INTERESTS

Languages (Proficient): English, Tamil

Languages (Less proficient): German, Telugu

Software: Python, Julia, LAMMPS, Mathematica, LaTeX, Git

Areas of Interest: Theoretical physics, Deep learning, Tensor networks, Quantum computing, High-performance computing

ADVANCED COURSES TAKEN

- **Theoretical Condensed Matter Physics** at IITB
Instructor: Prof. Hridis Kumar Pal
 - Second quantization, Interacting electron gas, Superconductivity, Magnetism
- **Statistical physics 1** at WIS
Instructor: Prof. Oren Raz
 - Equilibrium statistical physics: Phase transitions and critical phenomena, Ising type models; Analytical and numerical methods, renormalization group approach; correlation functions
 - Spin Glass physics: mean-field models, the replica trick, replica symmetry breaking
- **Quantum field theory 1** at WIS
Instructor: Prof. Ofer Aharony
 - Perturbation theory and Feynman diagrams from Path Integrals (scalars and fermions), perturbative regularization and renormalization, optical theorem and the LSZ reduction formula, Renormalization group
 - QED, gauge fixing and the Faddeev-Popov procedure, Ward Identities, non-Abelian gauge theories
 - Non-perturbative field theory: QCD (qualitative). 3d QED, instantons and confinement
 - Symmetries in QFT, Goldstone's theorem, renormalization and symmetry, the Higgs mechanism (classical and quantum)
- **Elementary particles 1** at WIS
Instructor: Prof. Yosef Nir
 - *The Standard Model: From Fundamental Symmetries to Experimental Tests* authored by Yuval Grossman and Yossi Nir (the course was taught from the draft version of the book)

•**General relativity**

at WIS

Instructor: Prof. Ulf Leonhardt

- Mathematics required for GR, Einstein equations, Gravitational waves, Black holes, elementary cosmology

•**Practical Deep Learning for Science**

at WIS

Instructor: Prof. Eilam Gross

- Convolutional Neural Nets, Graph Neural Nets, Transformer, Diffusion

•**Supersymmetry (not yet graded)**

at WIS

Instructor: Prof. Micha Berkooz

- Supersymmetric QM, SUSY algebra and representations, SUSY in 4d, SUSY Gauge theories

KEY COURSE PROJECTS

•**Accent modulation using cVAE architecture**

at WIS

Course: Practical Deep Learning for Science

1 month

- Learnt various audio processing features like STFT, Mel spectrogram, MFCCs etc.
- Build a cVAE using pytorch modules in python
- Used one hot encoding to switch between accents using audio features like MFCC and time-domain data
- Dataset used: AccentDB - Core & Extended

•**Deep Learning with particle collider collision event**

at WIS

Course: Experimental Projects

3 weeks

- Understood blocks of code developed by the group of Prof. Eilam Gross
- Modified it to suit the goal of our project, i.e. to determine the fraction of charged and uncharged particles in a collider event

WORKSHOP & SCHOOLS

•**Tri-Institute Summer School on Elementary Particles**

2023

- Exposure to various aspects of particle physics. Topics in the summer school ranged from theoretical to experimental/observational aspects of particle physics: Underground experiments, cosmology and gravitational waves, to list a few.