S.ASHWIN BALAJI

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OBJECTIVE

To pursue graduate studies in the field of Loop Quantum Gravity at a University internationally reputed for its high standards of research and seek position in Research Group for contributing to Research.

EDUCATION

National Institute of Technology, Calicut *July 2017 - Present*
B170632EP, Engineering Physics, Bachelor in Technology CGPA: 7.58 (5 sem)
Department of Physics

Suguna PIP School, Coimbatore *June 2015 - March 2017*
Central Board of Secondary Education (CBSE). Overall Percentage: 81.6

AKR Academy, Tiruppur *June 2012 - March 2015*
Central Board of Secondary Education (CBSE). Overall Percentage: 93

RESEARCH INTERESTS

Interested in exploring and understanding the meaning of Time, Primordial Cosmology, Quantum Foundations and role of Gauge Symmetries in Field Theories in the context of Loop Quantum Gravity and to contribute to current frontiers of Research in these areas.

RESEARCH EXPERIENCES

Renormalization of Gauge Theories and Gravity Dr.Sreeraj, Assistant Professor, NITC
Lattice Gauge Theory *Project, Present*
The project aims at progressing towards a plausible explanation for Chiral Symmetry and Fermion Doubling using the concepts of Lattice Gauge Theory

***N*-Color Ashkin-Teller Model** Dr. Rajesh Narayanan, Associate Professor, IITM
Theoretical Condensed Matter Physics *Summer Internship, April 2019 - July 2019*
The project aims at solving analytically the N-Color Ashkin-Teller Model using Mean Field Theory to compute the Critical Exponents of the System.

SCHOLASTIC ACHIEVEMENTS

- Achieved **99.98%** percentile in **JEE Main 2017** among 1.2 million candidates nationwide.
- Recipient of Engineering Physics degree offered to select 15 students among 786,494 aspiring candidates Nationwide.
- Participant of INOI 2017 by qualifying ZIO/ZCO 2017.

TECHNICAL SKILLS

Programming Languages C++, CUDA(C++) ,FORTRAN , Python, Julia
Softwares & Tools MATLAB, Mathematica, LaTeX, MySQL
Operating Systems Windows, Ubuntu, CentOS
Note: For a comprehensive list, please visit my personal portfolio here.

ACADEMIC/COURSE PROJECTS

WaveGuide-Mode-Visualizer Dr. Ram Ajor Maurya, Assistant Professor, NITC
Computational Physics *Project, May 2020*
This is a program to visualize the Electric and Magnetic Field in a Rectangular Waveguide for both TE Mode and TM Mode. It is written in Python 3.7 with 3D Visualization Package Mayavi and PyQt5 Package.

HiFi Run Dr. Archana, Ad-Hoc, NITC
Modelling and Simulation using Python *Project, March 2020*
This is a Retro based 2D Side-Scroller Game developed using Pygame package in Python Language implementing the Game Design Principles.

Economics Project - Qualitative Interview Dr.Rekha, Ad-Hoc, NITC
Engineering Economics *Project, March 2020*
The projects aims at interviewing CEO of a IIMB incubated Entrepreneur Company - Rekindle Automations to learn the Principles of Micro-Economics from a practical perspective.

Reading SPC Data Dr. M. K. Ravi Verma, Professor, NITC
C Programming *Summer Project, May 2018 - June 2018*
The project aims at translating MATLAB code to C code which can read Spectrum files(with an extension of **.spc**) generated by instruments during experiments to aid further Data Analysis.

Numerical Solution of ODE using FDM Prof. Sourav Mondal, Academic Head, SPIPS
Physics *CBSE Project, 12th Standard*
The projects aims at verifying analytic solution of a 2nd order Ordinary Differential Equation arising in the study of driven LCR Circuit, numerically using Finite Difference Method in C++ language.

RELEVANT COURSEWORK

Physics : Applied Quantum Mechanics, Relativity and Gravitation, Statistical Mechanics, Condensed Matter Physics I & II, Atomic Physics, Computational Physics, Modeling and Simulation using Python, Advanced Quantum Mechanics*
Mathematics : Calculus, Linear Algebra, Differential Equations (ODE & PDE), Complex Analysis, Probability and Statistics, Graph Theory* , Bayesian Statistics†, Stochastic Processes†
Management : Principles of Management, Engineering Economics
*To be completed by November 2020
† Completed in Coursera

CAMPUS ACTIVITIES

- Organizer and Core Committee Member for Science Outreach Activity by Cygnus : The Physics Association
- Class Representative for the Global Elective Course - *Modelling and Simulation using Python*
- Drafted the Lab Manual for the Course - *Computational Physics Lab*

WORKSHOPS AND CONFERENCES

- Quantum Information in QFT and AdS/CFT by IITG
- Research Writing - Technical and Language Aspects Workshop by MHRD-TEQIP-III by NITC
- Entrepreneurship Awareness Camp by TBI and TEQIP-III by NITC

ONLINE COURSES

- **Julia Scientific Programming(Honors)** by University of Cape Town on Coursera.
- **3D Data Visualization for Science Communication** by University of Illinois at Urbana-Champaign
- **Data-driven Astronomy** by The University of Sydney on Coursera.
- **Deep Learning Specalization** by deeplearning.ai on Coursera.
- **TensorFlow in Practice Specalization** by deeplearning.ai on Coursera.
- **Machine Learning** by Stanford University on Coursera.
- **Parallel Computing with HPC Systems(Complete)** by Udemy.

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EXTRA-CURRICULAR

- Active member in Physics Stack Exchange community for more than a year.
- Representative and Core Committee Member of the Skill Craft Academy; an NITC alumni initiative to build a soft and hard skills training center. My job includes:
  1. Conducting training for Python, Data Structures and Algorithms courses
  2. Taught Statistical Thermodynamics Course for 10+ Students.
  3. Teaching Assistant for C++ and SQL Course
  4. Preparing the Course Material (PPT, supporting code files, etc)
  5. Coordinating with Students and Faculty Members
  6. Mentoring Students in completing their curriculum projects, assignments, etc.
  7. Hosted a Virtual Internship Platform for 6 students in Deep Learning aimed to develop Data Intensive Apps with potential use in Education Industry during COVID-19 Lockdown.
  8. Core team member for Web Development Team. Look at the website here.
  9. Website Administrator and Course Content Creator using Wordpress
  10. Soft Skill Trainer
- Project for National Children's Science Congress 2010-2011 & 2011-2012 on Possibility of Agriculture in and around River Noyyal. This is a **Research project** during Schooling.
- Won many prizes in Quiz competitions; both inter-school and state-level during Schooling.

PERSONAL INTERESTS

- Finding Connections in Eastern Theology and Western Philosophy
- Make Presentations and Scientific Visualizations
- Design Posters
- Blogger
- MEAN Stack Web Development
- Play Harmonium/Piano (beginner)
- Cooking Vegetarian Dishes