Aaroodd Ujjayini Ramachandran

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Education and Training

Master of Science in Physics — **Oct 2019 – Jan 2022**
Rheinisch-Westfälische Technische Hochschule Aachen — Aachen, Germany
Master Thesis: Sterile neutrino production mechanisms in presence of Non-Standard Interactions — Astroparticle Physics and Cosmology track
GPA: 1,6

Bachelor of Technology in Engineering Physics — **Jul 2015 – May 2019**
National Institute of Technology Calicut — Calicut, India
Bachelor Thesis: Optically controlled droplet transport platform — First Class with Distinction (GPA: 8.37/10)

Summer School on Gravitational Quantum Physics — **Jun 2022**
University of Vienna — Vienna, Austria
Introductory lectures on general relativity, quantum information and quantum field theories in curved space-time.

Work Experience

Wissenschaftliche Hilfskraft — **May 2021 – Jul 2021, May 2022 –**
TTK Institute RWTH Aachen, Karlsruhe Institute of Technology — *Germany*
- LaTeX typesetting of lecture notes for the courses offered by Prof. Felix Kahlhöfer in WiSe 20/21, SoSe 21 and SoSe 22.

Wissenschaftliche Hilfskraft — **Sep 2021 – Oct 2021**
RWTH International Academy — *Aachen, Germany*
- Tutoring for the bridging course in Statistical Physics (*Theoretische Physik IV*) as part of Masters College in Physics for international students at RWTH Aachen.

Summer Project Fellow — **Jun 2018 – Jul 2018**
Indian Institute of Astrophysics — *Bangalore, India*
- Successfully completed a summer project on "*U band photometric studies of high-declination fields of interest to UV astronomy*" using data from Himalayan Chandra Telescope, *Hanle*.

Projects

Sterile neutrino dark matter production mechanisms in presence of NSIs — **Dec 2020 - Dec 2021**
- Master thesis under the supervision of Prof. Dr. Achim Stahl and Dr. Werner Rodejohann.
- Studied the effect of scalar, axial-vector and pseudoscalar non-standard neutrino self-interactions on the Dodelson-Widrow mechanism with Majorana neutrinos and demonstrated that experimentally allowed neutrino NSSIs can lead to sizable shifts in allowed parameter space.

Optically controlled droplet transport platform — **Jul 2018 – Jun 2019**
- Bachelor thesis under the guidance of Dr. Subramanyan Namboodiri Varanakkottu
- Design and implementation of a novel lab-on-chip "optically controlled digital microfluidic device" for on-demand droplet transport and exploring its applications in biochemical analysis.

Achievements and Scholarships

JN Tata Endowment in Physics
2019-2021
- Awarded by Tata trusts for the higher education of Indians abroad in Humanities, Natural Science, and Technology.

STIBET Studienabschluss-Stipendium
2021
- Scholarship for degree completion as part of scholarship and advising program for international students and doctoral candidates (STIBET), funded by German Academic Exchange Service (DAAD).

Programming Skills

Familiar with: Python, Mathematica, LaTeX, TensorFlow, Keras

Certifications

TOEFL iBT : C2 (114/120) **German** : A2
GRE General : 324/340

Publications & Poster presentations

- Benso, Cristina, Werner Rodejohann, Manibrata Sen, and **Aaroodd Ujjayini Ramachandran**. "Sterile neutrino dark matter production in presence of nonstandard neutrino self-interactions: An EFT approach," *Phys. Rev. D* **105** (5), 055016 (2022), arXiv:2112.00758 [hep-ph].
- Benso C., **Ujjayini Ramachandran A.** *Impact of neutrino effective NSSI on sterile neutrino dark matter production in the early universe.* Poster presented at: Neutrino 2022; June 2022; Virtual Seoul.