Achmad Aditya Gerwin

Curriculum Vitae



Research Experiences

Summer 2022 – Spring 2023 **Run 2 Iteration of Higgs to Long Lived Particle Analysis**.
- Using LHC run-2 zero bias datastream to do data-driven background estimation for jets with displaced vertices

Summer 2023– Summer 2025 **Flex PCB Quality Control for ATLAS Inner Detector Phase 2 Upgrade**.
- Cleanroom monitoring using *influxDB* and *Grafana*
- Developing new interface to perform low voltage-high vltage test on flex PCB in *RaspberryPi* with c++ based *Picolog* wrapper
- Developing automatic image aligning and cropping to be used in machine learning image anomaly detector for flex PCB visual inspection
- Training a convolutional autoencoder algorithm to perform automated PCB visual defect inspection

Spring 2024– Summer 2024 **Preliminary Studies of Higgs Decay into Displaced and Emerging Jets**.
- Creating *monte carlo* samples for displaced and emerging jets decay in multiple channels
- Signal triggers efficiency studies; estimating the significance of signal with new triggers

Summer 2023– Present **Combined Performance Works in Inner Detector Alignment of ATLAS Experiments**.
- Fixing alignment database issues which prevent alignment loop to be done on ATLAS inner tracker's end cap region
- Developed evolution plots and maintaining the alignment monitoring webapp for monitoring the quality of alignment loop
- Performing alignment loop shift; monitoring alignment jobs and verifying the alignment result and quality
- Studied the residual bias in run 3 data and released track impact parameters recommendations

Summer 2024– Present **Study of Higgs Decay into Displaced and Emerging Jets**.
- Lead analyzer of Higgs to Displaced Jets using LHC run-3 data analysis
- Background triggers efficiency studies; investigating data/*monte carlo* scale factor for triggers targeting displaced jets
- Background estimation studies. Developing data-driven background estimation strategy using mistag maps and ABCD method
- Development of analysis frameworks and plotting tools

Research Advisor : **John Stupak, Ph.D.**, Department of Physics, University of Oklahoma

Education

2016–2020 **BSc, Physics**, *University of Indonesia*, Jakarta.
Thesis: Coleman-de Luccia Tunneling Wave Function with Non-Minimal Coupling, GPA: 3.89/4.00.

2020–2021 **Master Program, Physics**, *University of Indonesia*, Jakarta.
No degree awarded.

2021–2024 **M.Sc., Physics**, *University of Oklahoma*, Norman, Oklahoma.
Non-Thesis Master Degree, GPA: 4.0/4.0

2021–Present **Ph.D., Physics**, *University of Oklahoma*, Norman, Oklahoma.

Talks

2020 **A. A. Gerwin, H. S. Ramadhan**, *Coleman-de Luccia Tunneling Wave Function with Non-Minimal Coupling*, In *International Conference of Theoretical and Applied Physics 2020*, Lombok, Indonesia.

2023 **Quality Control for ATLAS Phase 2 Inner Tracker Upgrade at The University of Oklahoma**, USLUA Annual Meeting, Fermi National Laboratory.

Publications

2020 **A. A. Gerwin, H. S. Ramadhan**, *Coleman-de Luccia Tunneling Wave Function with Non-Minimal Coupling*, J.Phys.Conf.Ser. 1816 (2021) 1, 012020, DOI: 10.1088/1742-6596/1816/1/012020.

Past Research Experience

August,2019 – July,2020 ***Studying The Phenomenon of Vacuum Decay***.
Studying Coleman-de Luccia vacuum decay formalism and the tunneling wave function alternative for vacuum decay.

Advisor : **Handhika Satrio Ramadhan, Ph.D.**, Department of Physics, University of Indonesia

Academic Achievements & Recognitions

2020 Graduated with Cum Laude from University of Indonesia

2020 Best Bachelor Graduate, Department of Physics, University of Indonesia

2024 Avenir Fellowship Awardee

2024 Robberson and Wethington Scholarship Awardee

Workshops and Trainings

2022 CAMPFIRE Workshop, Argonne National Laboratory

2022 ATLAS Analysis Based Software Tutorial, SLAC

2024 Machine Learning for Fundamental Physics School 2024, LBNL

Computing skills

Programming Languages for Computational Physics

Python, GNU Octave, Fortran90

ATLAS Software Interface

C++ based ATHENA with Python and YAML Configuration, ROOT