Nicholas J. Benoit

SUMMARY

Recent doctorate graduate researching elementary particle physics. Experienced with the academic research methods, and academic teaching methods. Interested in neutrino phenomenology, foundations of quantum field theory, and non-equilibrium quantum field theory approaches.

EDUCATION

Graduated in Sept 2022 | **Hiroshima University, Graduate School of Science**

- Higashihiroshima, Hiroshima Japan
- Sc.D. Physics.
- Thesis Title: Neutrinos and lepton number oscillations in quantum field theory
  - Open access available from the Hiroshima University, library repository
- April 2022 – Sept 2022, Japanese Government MEXT Scholar

Graduated in May 2019 | **University of Massachusetts of Dartmouth, Graduate School of Engineering**

- Dartmouth, Massachusetts United States of America
- M.Sc. Physics. GPA: 3.463/4.0
- Thesis Title: Seesaws and toy models for neutrinos
- Awarded the Graduate Research Award from the physics department in 2019.

Graduated in May 2015 | **Roger Williams University, School of Engineering**

- Bristol, Rhode Island United States of America
- B.S Electrical Engineering (ABET Accredited) with minors in music and physics. GPA: 3.309/4.0
- Awarded the Professor Richard M. Heavers Memorial Award from the physics department in 2014.

RESEARCH EXPERIENCE

Oct 2019 – Sept 2022 | **Hiroshima University**

PhD Graduate Researcher

- Studied massive neutrino phenomenology in various situations.
- Led the research effort on wave packet effects in our model of Lepton Number oscillations.

Sept 2018 – May 2019 | **University of Massachusetts of Dartmouth**

1-D Quantum Scattering Project

- Studied the effect of 1-D quantum scattering on Levinson's Theorem.
- Numerically solved for the number of potential bound states with Levinson's Theorem.

Neutrino Toy Model Project

- Studied the formulation of a Type I Seesaw mechanism for Neutrino mass.
- Compared this formulation to a 2-D toy model based on Solid State Physics models.

RESEARCH PUBLICATIONS

Oct 2019 – Now | **Hiroshima University**

- **N J Benoit**, Y Kawamura, S Kawano, T Morozumi, Y Shimizu, and K Yamamoto (Preprint). "Determination of Majorana type-phases from the time evolution of lepton numbers" arXiv:2212.00142 [hep-ph]
- **N J Benoit**, T Morozumi, Y Shimizu, K Takagi and A Yuu (2022). "Renormalization group effects for a rank degenerate Yukawa matrix ... " PTEP 2022 (11), 113B02, arXiv:2210.00165 [hep-ph]
- A S Adam, **N J Benoit**, Y Kawamura, Y Matsuo, T Morozumi, Y Shimizu, N Toyota (Preprint). "Insight into neutrino mass phenomenology by exploring the non-relativistic regime in quantum field theory" arXiv:2106.02783 [hep-ph]
- A S Adam, **N J Benoit**, Y Kawamura, Y Matsuo, T Morozumi, Y Shimizu, Y Tokunaga, N Toyota (2021). "Time evolution of lepton number carried by Majorana neutrinos" PTEP 2021 (5), 053B01, arXiv:2101.07751 [hep-ph]

WORK EXPERIENCE

Oct 2019 – Feb 2021 | **Hiroshima University**

Qualified Teaching Assistant (QTA)

- Assisted students who joined the International Linkage Degree Program at Hiroshima University by supporting their Neutrino Physics study for a total of six months.
- QTA qualification was obtained by attending a course at Hiroshima University and passing an examination.

Graduate Research Assistant (RA)

- Assisted with research of charge-parity violation in the neutrino sector.
- Supported simple renormalization group calculations.
- Created various Mathematica calculations to support both of those research efforts.

Sept 2015 – Sept 2019 | **Lockheed Martin Sippican RMS**

Electrical Engineer

- Supported the update to a legacy design of a complex electromechanical system.
- Worked with small-signal conditioning and digital signal processing techniques.
- Troubleshot high power transformer circuits.
- Updated the design of a 6 degrees of freedom open-loop control system.

Electrical Engineer Asc

- Supported production failures of a complex electrical system.
- Worked with a team to support and troubleshoot any electrical failures seen during production testing.

Sept 2013 – May 2015 | **Roger Williams University**

Student Academic Tutor and Fellow

- Assisted students with any Physics homework.
- Led large study groups designed to help students study for an upcoming test.
- Sat in on a Physics class to help answer questions during group work
- Communicated with the Professors on what to focus on when helping students.

INTERNATIONAL EXPERIENCE

Sept 2021 – Sept 2022 | **Hiroshima International Plaza**

Global Relations Program (GRP) Trainee

- This program is for international students to acquire practical skills for becoming a global citizen.
- The practical skills are obtained through three methods, living in an international community, participation in Japanese culture, and sharing of personal culture.
- Acceptance to the program is based on a recommendation by the trainee's university and a panel interview.

SKILLS AND INTERESTS

Computer： Microsoft Office Suite | LaTeX | VS-Code | Julia | Mathematica | Linux (Arch linux mainly)
Technical Devices : Oscilliscope | Digital Logic Analyzer (Tektronix) | Audio Precision
Language：Native English Proficiency | Basic Japanese Proficiency
Research：Technical and Public Research Presentation Ability | Professional Writing Ability (English Only)
Additional Interests：Tea | Music Theory | International Exchange | Metascience

PROFESSIONAL ORGANIZATIONS

Oct 2020 – Now | **The Physical Society of Japan (JPS)**
Oct 2013 – Feb 2018 | **Institute of Electrical and Electronics Engineers (IEEE)**
Feb 2013 – Dec 2017 | **Engineers Without Boarders (EWB)**