Eric Woolsey

Protocol Engineer | Ph.D. Physics

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Protocol engineer and experimental physicist who builds novel, deeply technical systems end-to-end, backed by a research career involving Monte Carlo simulation, detector design, machine-learning, data analysis and academic writing.

EXPERIENCE

World Chain Lead, Senior Protocol Engineer II 2024 – Present
World (Tools for Humanity)

- Designed and shipped novel **zero-knowledge circuits** running in production for millions of users, working across Noir, Circom, Gnark, Plonky3, SP1, and RISC Zero.
- Built core **World protocol infrastructure**, including the World Chain execution client, proof system, Flashblocks, and rollup-boost.
- Developed audited **Solidity** contracts deployed to Ethereum, Base, Optimism, and World Chain.
- Created deployment tooling that builds, optimizes, configures, deploys, migrates, and interacts with multi-contract protocols.
- Deployed scalable Kubernetes services to the cloud using Helm and ArgoCD.
- Mentored new hires, ramping them up on an unfamiliar language and development environment.

Principal Engineer 2021 – 2023
Cryptech Developments

- **Sole protocol engineer** on the Neptune Protocol: designed and built its smart contracts and liquidation service.
- **Sole author** of the Neptune Money Market Whitepaper, detailing the protocol's design and its PID-controlled interest rate curve.
- Architected audited, multi-contract **Rust** protocols from the ground up, prioritizing safety, scalability, and efficiency.
- Built backend APIs, chain indexers, and autonomous bots that monitor and transact on-chain.
- Wrote **Monte Carlo market simulations** to model market behaviour and tune protocol parameters.
- Designed rigorous testing and CI strategies for mission-critical financial systems.
- Owned developer tooling, cloud deployment, and onboarding of new engineers.

TECHNICAL SKILLS

Languages	Rust, Solidity, C, C++, Go, TypeScript, Python, SQL
Zero Knowledge	Noir, Circom, Gnark, Plonky3, SP1, RISC Zero; ZK rollups, Ethereum coprocessors, privacy-preserving on-chain proofs
Blockchain	EVM smart contracts, Rust smart contracts, protocol design, execution clients, chain indexers
Infrastructure	Docker, Kubernetes, Helm, ArgoCD, AWS, CI/CD
Scientific Computing	Monte Carlo methods, GEANT4, ROOT, COMSOL, ANSYS Maxwell3D, PyTorch, TensorFlow, parallel computing
Hardware	Analog & digital electronics, PCB prototyping, FPGAs, lab instrumentation

EDUCATION

Ph.D., Physics 2021
University of British Columbia Vancouver, BC

B.Sc., Physics 2015
University of Alberta Edmonton, AB

RESEARCH EXPERIENCE

Doctoral Research: nEXO Collaboration · *University of British Columbia* 2016 – 2021

- Designed and prototyped a Cherenkov light detector for nEXO, a neutrinoless double-beta decay search, built from silicon photomultipliers surrounding a cryogenic liquid-xenon core.
- Built a full **GEANT4 Monte Carlo** model from scratch, simulating xenon excitation and decay and tracking individual quanta through the detector; used it to optimize detector performance.
- Developed bespoke **machine-learning** algorithms to separate signal from noise in high-volume simulated data and quantify detector efficacy.

Novel Photodetector Design · *University of Alberta* 2015 – 2017

- Designed and simulated a PMT-style photodetector using a silicon photodiode array to directly detect photoelectrons; modelled electron-focusing fields in COMSOL and system response in GEANT4.

PINGU Neutrino Observatory (IceCube Collaboration) · *University of Alberta* 2015 – 2016

- Designed, built, and tested a prototype circuit board digitally controlling a picosecond LED pulser for precision detector calibration.

DEAP-3600 Dark Matter Experiment · *University of Alberta* 2011 – 2015

- Simulated, designed, built, and installed a scintillating-fibre veto photodetector to reject background events in the main vessel.
- Modelled the full detector with the Reactor Analysis Tool (RAT) to characterize background discrimination.
- Rewrote the data-analysis software used to process and visualize raw detector data.
- Tested and optimized signal-conditioning electronics on the UofA testbed; assembled detector components.

AWARDS & SCHOLARSHIPS

ISOSiM Scholarship – $32,400, research in nuclear isotopes and radiation 2016 – 2020

Queen Elizabeth II Graduate Scholarship – $10,800, top of class, University of Alberta 2015

NSERC Undergraduate Student Research Award – $4,500 2013

Louise McKinney Scholarship – $2,500, top 1.5–2% of class 2011 – 2012

Faculty of Science Academic Excellence Scholarship – $1,000 2011

Dean's Honour Roll, University of Alberta – three consecutive years 2011 – 2014

VOLUNTEERING

Biathlon Bears youth coach (350 h) · Science Fundamentals demonstrator for elementary schools (90 h) · Alberta Health Services (50 h) · Habitat for Humanity build site (26 h) · Halloween for Hunger food drive (5 h)