Fuad Hasan

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Fuad Hasan | fuad-hh | Fuad Hasibul Hasan

Troy, NY

Objective

Seeking an internship to contribute to fusion/fission energy research as a Ph.D. student researching fusion reactor neutral particle simulation, leveraging advanced programming and high performance computing skills.

Experience

- **Rensselaer Polytechnic Institute** *August 2023 - Current*
  Graduate Assistant Troy, NY
  - Currently working as a research assistant on the Department of Energy (DOE) funded Scientific Discovery through Advanced Computing (SciDAC) projects. Developing C++ libraries for accelerated neutral particle simulation and coupling for fusion applications.
  - Worked as a teaching assistant for Computer Science I in Fall 2023. I conducted lab sessions, held office hours, and graded tests.
- **NATS Incorporated** *August 2022 - April 2023*
  Field Application Engineer Middletown, CT (Remote)
  - Posted to Bangladesh as an overseas employee responsible for installation, training, and pre- and post-sales services for NATS equipment.

Education

- **Rensselaer Polytechnic Institute** *August 2023 - Present*
  Ph.D. in Nuclear Engineering Troy, NY, USA
  - GPA: 3.93/4.00 (ongoing)
- **University of Dhaka** *2021 - 2022*
  M.Sc. in Nuclear Engineering Dhaka, Bangladesh
  - Grade: 3.58/4.00
  - Dissertation Title: Coupled Neutronic and Thermal-Hydraulic Analysis of a Conceptual Small Modular Fast Reactor Fuel Pin Using OpenMC, OpenFOAM, and ENRICO.
- **University of Dhaka** *2016 - 2021*
  B.Sc. in Nuclear Engineering Dhaka, Bangladesh
  - GPA: 3.48/4.00
  - Dissertation Title: Neutronic Analysis of an Ultra-Long-Life Small Modular Fast Reactor Loaded with U-Zr-Pu Fuel Using Monte Carlo Code OpenMC.

Selected Publications

C=Conference, I=In-Prep/In-Submission

[I.1] Fuad Hasan, Cameron W Smith, Mark S Shephard, R Michael Churchill, George J Wilkie, Paul K Romano, Patrick C Shriwise, Jacob S Merson (2025). **GPU Acceleration of Monte Carlo Tallies on Unstructured Meshes in OpenMC with PUMI-Tally**.

[I.2] Jacob S Merson, Cameron W Smith, Mark S Shephard, Fuad Hasan, Abhiyan Paudel, Angel Castillo-Crooke, Joyal Mathew, Mohammad Elahi (2025). **PCMS: Parallel Coupler For Multimodel Simulations**.

[C.1] Fuad Hasan, Paul Romano, Patrick Shriwise, Aditya Y. Joshi, Michael Churchill, Hunter Belanger, Cameron Smith, Mark S. Shephard, and Jacob Merson. **GPU enabled unstructured mesh tallies for fusion neutron transport simulations.** 18th US National Congress on Computational Mechanics, July 23, 2025.

[C.2] Fuad Hasan, George Wilkie, Paul Romano, Patrick Shriwise, Michael Churchill, Cameron W. Smith, Mark S. Shephard, and Jacob Merson. **Integrating OpenMC and PUMIPic to Enable GPU Acceleration of Unstructured Mesh Tallies for Monte Carlo Transport Simulations.** Open Source Software for Fusion Energy (OSSFE) Conference, Mar. 18, 2025.

[C.3] Jacob Merson, Fuad Hasan, George J Wilkie, Mark S Shephard (2025). **Using PCMS to Accelerate Coupling of Gyrokinetic Microturbulence with Neutral Particle Transport**. 67th Annual Meeting of the APS Division of Plasma Physics, Nov. 2025.

[C.4] Albert Mollen, Toseo Moritaka, Aaron Scheinberg, Robert Hager, Hongxuan Zhu, Michael Churchill, Seung Hoe Ku, Jacob Merson, Fuad Hasan, Mark Shephard, CS Chang (2024). **Simulation of plasma turbulence in stellarator equilibria with the global gyrokinetic particle-in-cell code XGC**. In *Bulletin of the American Physical Society*. American Physiological Society (APS). October 7–11, 2024; Atlanta, Georgia.

Skills

- **Programming Languages:** C++, Python, C, LaTeX, R, MATLAB
- **Libraries/Frameworks:** Kokkos, CUDA, Catch2, ADIOS2, HDF5, MPI, etc.
- **Tools:**
  Modeling and Meshing Tools: Simmetrix, Siemens NX, Omega_h, Gmsh
  Tracing and Profiling Tools: HPCToolkit, TAU
  Misc. Tools: CMake, Bash, Git, CI/CD, OpenMC, Matplotlib, NumPy, ParaView

Research Specialties

- **Accelerated Unstructured Mesh Tally**
  Developing libraries for performance portable, accelerated neutral particle simulation with Monte Carlo tally in distributed unstructured meshes; parallel search algorithms; verification; API design
- **Multiphysics Coupling**
  Designing API for coupled multiphysics simulation (gyrokinetic plasma simulation with Monte Carlo neutral particles simulation) of fusion reactors with different discretization; accelerated geometry conversion

Awards

- **National Science and Technology Fellowship** *2021*
  Ministry of Science and Technology, Bangladesh
- **Winner of Global Atomic Quiz** *2021*
  Rosatom (online)

Internship & Trainings

- **Argonne Training Program on Extreme-Scale Computing (ATPESC) 2025** *27 July - 8 August 2025*
- **Joint ICTP-IAEA Advanced School/Workshop of Computational Nuclear Science and Engineering** *23-27 May 2022*
- **Joint ICTP-IAEA Course on Theoretical Foundations and Application of Computational Fluid Dynamics in Nuclear Engineering** *13-17 September 2021*
- **Research Intern at Materials Science Division, Bangladesh Atomic Energy Commission** *2020*
- **Trainee at Non-destructive Testing Division, Bangladesh Atomic Energy Commission** *March 2019 - May 2019*

Additional Information

Languages: Bangla (Native), English (Proficient)

Last Updated: January 28, 2026