

UMANGA BARAL

Mathematics & Physics Double Major — Howard University

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Education

Howard University, Washington, DC

Aug. 2025–May 2029

B.Sc. Mathematics & Physics (Double Major)

GPA: 4.00/4.00

Relevant Coursework: Calculus I, Calculus II, Physics I, Computer-Aided Design (CAD)

Kathmandu Model College, Nepal

NEB Class XII, CGPA: 3.88/4.00

V.S. Niketan Secondary School, Nepal

NEB Class X, CGPA: 3.93/4.00

Research Interests

Real analysis, Mathematical Physics, Nonlinear PDEs, Dynamical Systems, Computational Modeling, number theory.

Research Experience

Research Assistant, Department of Mathematics, Howard University

Sept. 2025–Present

Research under Prof. Roberto De Leo on nonlinear mathematical models of DNA interactions. Investigate the Sine–Gordon equation and numerical methods for soliton dynamics using Python to study nonlinear wave propagation and biomolecular stability.

Research & Technical Projects

Farm Buddy – NASA Space Apps Challenge (Global Nominee)

- Developed a web platform using NASA Earth observation data to visualize soil moisture and flood risk.
- Contributed mathematical models for agricultural decision support.

Robo Yuwa – Technoxian Robotics Competition

- Designed five autonomous race cars and sumo robots using Fusion 360 CAD.
- Won the national round and advanced to the international competition.

RC Plane Development

- Designed and prototyped five fixed-wing RC aircraft.

Leadership

- **Board of Directors, Mathematics Initiatives in Nepal** (2024–Present)
- **Head of Education Department, Mathematics Initiatives in Nepal** (2023–2024): Designed 15+ curricula, trained 300+ educators, mentored 50+ volunteers, reached 5,000+ students.
- **Head of Event Moderation, KMSS Maths Club**: Moderated 15+ mathematics competitions with 1,000+ participants.

Honors

International Youth Math Challenge (Silver Honor, 2024)

National Mathematical Olympiad TST (Top 25, 2024)

National Science Olympiad (Top 40, 2022)

Skills

Programming: Python, C

Technical: Fusion 360, CAD

Soft Skills: Leadership, Teaching, Public Speaking, Curriculum Design