Pratik Aghor

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Experience

Georgia Institute of Technology (GT) — Atlanta, GA, USA
Postdoctoral fellow in Earth and Atmospheric Sciences — Oct. 2023 –Current

- Focus: "Interaction of ocean currents and seamounts"

Education

University of New Hampshire (UNH) — Durham, NH, USA
Ph.D. in Applied Mathematics, GPA: 3.96/4.00, Advisor: Prof John F Gibson

- Thesis: "Symmetries, Bifurcations and Transition to Turbulence"

Jawaharlal Nehru Centre for Advanced Scientific Research (JNCASR) — Bengaluru, India
M.S. in Engineering Mechanics, GPA: 6.90/8.00, Advisor: Prof M Alam

- Thesis: "Pattern Formation and Anomalous Modes in Axisymmetric Compressible Taylor-Couette Flow"

Birla Institute of Technology and Science (BITS) Pilani — Pilani, India
B.E.(Hons.) in Mechanical Engineering, GPA: 8.25/10.00

- Thesis: "Investigation of Turing Patterns Using Finite Element Method and Symmetry"

Publications

[1] **P. Aghor**, A. Bracco, and K. G. Sabra, "Effect of topographic complexity and numerical resolution on acoustic propagation near the Atlantis II seamount", *under prep.*, 2026.

[2] **P. Aghor** and J. F. Gibson, "Invariant symmetric subspaces of plane Poiseuille flow", *in press, Journal of Fluid Mechanics*, 2025.

[3] **P. Aghor**, M. McKinley, and A. Bracco, "Interaction of ocean currents and seamounts: Role of bottom topography around Atlantis II", *under review*, 2025.

[4] M. Atif, P. Dubey, **P. Aghor**, V. López-Marrero, T. Zhang, A. Sharfuddin, K. Yu, F. Yang, F. Ladeinde, Y. Liu, *et al.*, "Fourier neural operators for spatiotemporal dynamics in two-dimensional turbulence", in *SC24-W: Workshops of the International Conference for High Performance Computing, Networking, Storage and Analysis*, IEEE, 2024, pp. 41–48.

[5] **P. Aghor** and M. Atif, "Effect of outer cylinder rotation on the radially heated Taylor-Couette flow", *Physics of Fluids*, vol. 35, no. 9, 2023.

[6] **P. Aghor** and M. Alam, "Nonlinear axisymmetric Taylor-Couette flow in a dilute gas: Multiroll transition and the role of compressibility", *Journal of Fluid Mechanics*, vol. 909, 2021.

Teaching

- **Teaching Assistant** at UNH — 2018 –2019, 2021-2022
  Linearity (covers ODE's, linear algebra, phase plane analysis), Multidimensional Calculus
- **Teaching Assistant** at BITS Pilani — 2015
  Finite Element Method (ME G512)

Scholarships and Awards

- **Department of Mathematics and Statistics Teaching Assistant Award, UNH** **2022–2023**
- **Dissertation Year Fellowship, UNH Graduate School Award** **2022–2023**
- **Departmental Nominee, Graduate School TA Teaching Award** **2021–2022, 2022–2023**
- **Research Assistant** **2019–2021**
- **R. Narasimha Award for the Best MS Thesis in Engineering Mechanics** **2017–2018**

Conferences, Workshops, Summer Schools

Acoustical Society of America joint with International Congress on Acoustics May 2023
New Orleans, LA, USA

- **Gave a talk on 'Effect Of Bottom Topography On Sound Propagation Near The Atlantis II Seamount'**

Rossbypalooze Jul 2024
University of Chicago

- **Worked with Prof. William Boos (UC Berkley) on tropical stationary waves**
- **Worked with Prof. Da Yang and Prof. Dorian Abbot (UChicago) on a reduced model of extreme tropical precipitation**

APS-DFD Meeting Nov 2023
Washington Convention Center Washington, DC, USA

- **Gave a talk on 'Instability Islands in the Radially Heated Taylor-Couette Flow'**

Boulder Summer School - Hydrodynamics Across Scales Jul 2022
University of Colorado Boulder, Colorado, USA

- **Poster presentation titled: 'Invariant Subspaces of Channel Flow'**

Visitng Graduate-Student Researcher Jun 2022
JNCASR Bengaluru, Karnataka, India

- **Gave a talk on 'Symmetry, Dynamics and the Method of Slices'**

APS-DFD Meeting Nov 2021
Phoenix Convention Center Phoenix, Arizona, USA

- **Gave a talk on 'Exploring Invariant Symmetry Subspaces of Channel Flow'**

School on Dynamics of Complex Systems May-Jun 2016
International Center for Theoretical Sciences (ICTS, Bangalore) Bengaluru, Karnataka, India

- **Theme - Geophysical Fluid Dynamics**

CIMPA Summer School on Current Research in Finite Element Method Jun-Jul 2015
Indian Institute of Technology (IIT, Bombay) Mumbai, Maharashtra, India

- **Conducted tutorial sessions on FreeFem++**

Finite Element Meet 2014 Dec 2014
Tata Institute of Fundamental Research (TIFR-CAM) Bengaluru, Karnataka, India

- **Gave a talk on 'Numerical Continuation and Bifurcation in Presence of Symmetry in FreeFem++'**

Relevant Coursework

Fluid Mechanics, Asymptotics and Perturbation Methods, Physical Oceanography, Geophysical Fluid Dynamics, Spatiotemporal and Turbulent Dynamics, Algebra I (Group and Ring Theory), Waves in Fluids, Nonlinear Vibrations, Electrodynamics, Theory of Relativity, Statistical Mechanics, Mathematical Physics, High Performance Computing, Numerical Linear Algebra, Numerical PDE's, Chaosbook Part 1 and 2.

Test Scores

- **All India Rank: 7 out of 3292 candidates** in GATE 2015, Engineering Sciences

Skills

- **Languages:** Python, Julia, MATLAB, C++, C, FORTRAN
- **Open Source Solvers:** FreeFem++, Dedalus, Channelflow, AUTO -07p, Tensorflow
- **Miscellaneous:** OpenMP, MPI, high performance computing, scientific computing, machine learning, ocean models

Extracurricular Activities (Sports, Writing and Outreach)

- **BITS Pilani University Taekwondo Team** 2014–2015
  Gold Medal in BOSM 2015, Bronze Medal in BOSM 2014
- Wrote a **Ted-Ed** Script **(at UNH) - The greatest mathematician that never lived** Jul 2020
  Video, *Transcript*
- Wrote an article for ***Loksatta***, a state-wide prominent Marathi language Newspaper about the **SIR Model of Epidemiology (at UNH)** Apr 2020
  Link
- Volunteer at the **Student Mentoring Program at JNCASR** 2017, 2018
  Taught $11^{th} - 12^{th}$ *standard physics and mathematics to economically backward students.*

Languages and Music

Proficient in: **Marathi, Hindi, English, Sanskrit**, Beginner level: **French**; Proficient in: Indian classical percussion **Tabla**, Intermediate: **Ukulele**.

References:

1. Prof. John F. Gibson (john.gibson@unh.edu)
2. Prof. Gregory P. Chini (greg.chini@unh.edu)
3. Prof. Annalisa Bracco (annalisa.bracco@cmcc.it/annalisa@eas.gatech.edu)