

Research Recommendation

19 July 2026

Dr. Shiv Prakash Verma

Chairman/CEO | Shiv Technopatents Private Limited

Ph.D., Electrical Engineering

To Whom It May Concern,

I am pleased to recommend Debosmita Sarkar for research opportunities, graduate study, fellowships, and other advanced academic programs. I write in support of her 2026 research preprint, A Provenance-Audited Gravitational World Simulator Validated Against DE440, with a Formal Predictability Analysis. Her work demonstrates intellectual independence, careful scientific reasoning, and an unusually strong commitment to making computational claims testable and traceable.

Debosmita's research develops a gravitational N-body simulator grounded in established physical laws and an automated provenance audit that links every numerical constant to a documented source. She initializes it from NASA JPL's DE440 ephemeris states and compares trajectories with real physical data. The work makes its assumptions, methods, validation targets, and limitations explicit - an unusually disciplined approach to computational physics.

A notable contribution is the Fidelity-Limit Theorem, a formal predictability analysis for chaotic systems that relates the horizon to integration order, step size, the largest Lyapunov exponent, measurement uncertainty, and stated tolerance. Her preprint also reports a general-relativistic calculation of Mercury's perihelion advance and documents partial outcomes where model incompleteness, rather than chaos, sets the fidelity limit. This candid treatment of evidence is a clear mark of research maturity.

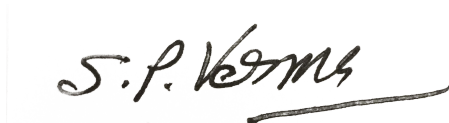
Her work is grounded in computational and celestial physics and points toward AI-enabled scientific discovery; her next proposed phase is an AI scientist agent that re-discovers governing laws from simulated data. Debosmita combines mathematical clarity, implementation discipline, and scientific integrity. I am confident she can make a meaningful contribution in a demanding research environment.

I recommend Debosmita Sarkar without reservation. I would be pleased to provide further information regarding this recommendation.

Research record: Debosmita Sarkar (2026), A Provenance-Audited Gravitational World Simulator Validated Against DE440, with a Formal Predictability Analysis. Zenodo DOI: 10.5281/zenodo.21329246. Research site: debosmitasarkar.site. Open-source code: github.com/debosmita-sarkar/gravitational-world-simulator.

Sincerely,

Signature:



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