

## GAURAV KHANNA

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### Positions Held

- 2016 – Present: Professor (UMass Dartmouth)
- 2013 – Present: Co-Director (Center for Scientific Computing & Visualization Research)
- 2009 – 2016: Associate Professor (UMass Dartmouth)
- 2003 – 2009: Assistant Professor (UMass Dartmouth)
- 2000 – 2004: Assistant Professor (Long Island University)

### Education

- Pennsylvania State University, University Park, PA 16802  
The Institute for Gravitation and the Cosmos,  
Department of Physics.  
Advisor: Prof. Jorge Pullin.  
Degree: Ph.D. August 2000 (GPA: 3.95)
- Indian Institute of Technology, Kanpur, India.  
Electrical Engineering (Minor in Physics),  
Degree: B.Tech. May 1995 (GPA: 3.56)

### Awards & Grants

- Over 10 *National Science Foundation* (NSF) grants as PI (2002-). Active awards:  
PHY 2010685 – *Studies of Black Hole Binary Systems Using Time-Domain Perturbation Theory* (2020 – 2022); PHY 1701284 – *Studies of Large Mass-Ratio Black Hole Binaries Using Time-Domain Perturbation Theory* (2017 – 2020).  
Full listing available here: <https://bit.ly/3c1Bgwd>
- Multiple federal grants (ONR, AFOSR, NSF) as Co-PI (2008-). Active award:  
PHY 1912716 – *High Order Numerical Methods for Gravitational Wave Computations* (2019 – 2022).
- Multiple private foundation grants (*Glaser Trust, Foundational Questions Institute, Fund for Astrophysics*).
- Multiple in-kind grants from industry (IBM, Apple, Sony, Nvidia, HPE).
- UMass Dartmouth Chancellor's *Innovations in Teaching Award* (2005-2006).

- UMass Dartmouth *Healey Fund* research grant (2004-2005).
- Physics Department Teaching Award at Penn State (1997-1998).
- Multiple (*Braddock, Duncan, Roberts, T. Das*) Fellowships at Penn State (1995-2000).

## Administrative Experience

- Current and founding Co-Chair of UMass system wide *Faculty Advisory Committee* for the *Massachusetts Green High-Performance Computing Consortium* <https://mghpcc.org>. The committee advises the UMass MGHPCC operations team on hardware, software, support and budgetary issues. The committee recently led the advocacy effort to renew the UMass investment into the MGHPCC under a challenging fiscal climate.
- Current member of the MGHPCC Research-Education-Outreach Committee. Serve as one of the UMass representatives alongside representatives of MIT, BU, NEU and Harvard.
- Current and founding Co-Director of UMass Dartmouth's *Center for Scientific Computation and Visualization Research* <http://cscvr.umassd.edu>. The Center supports (hardware, software, support) the computational research efforts of over 30 faculty-members and their graduate students.
- Current XSEDE Campus Champion. Serve as a resource for researchers who wish to utilize NSF's XSEDE and other cloud services.
- Current and founding Graduate Program Director of UMass Dartmouth's *Engineering and Applied Sciences Ph. D. Program* – the largest Ph.D. program on-campus.
- Served as guest editor for a 2018 special issue of IEEE CiSE with a focus on supercomputing.
- Official member (invitation only) of Apple Inc.'s *AppleSeed* group. Receive early builds of *unreleased* Apple software for testing and evaluation.
- Active participation on several academic committees in the Physics Department, the College of Engineering and the university, and the UMass system.
- Served as Math-Physics Coordinator for the Natural Science Division at Long Island University, Southampton.
- Served as Technology Center Coordinator for Long Island University, Southampton.

## Research Experience

- Full Professor at University of Massachusetts, Dartmouth (since 2016).

*I work on different problems in the broad area of computational physics: Coalescence of binary black hole systems using black hole perturbation theory and estimation of the properties of the emitted gravitational waves (this project is of direct relevance to the NSF LIGO laboratory that recently made a direct observation of this radiation –*

*a Nobel prize winning discovery); Loop quantum cosmology (a study of cosmological and black hole models in the context of loop quantum gravity wherein space-time is considered discrete at a very fundamental level); Computational science and high-performance computing (cluster and GPU-computing).*

- Associate Professor (with tenure) at University of Massachusetts, Dartmouth (since 2009).
- Assistant Professor at University of Massachusetts, Dartmouth (2003-2009).
- PI of several research grants. Continuously funded since 2002. Funding total over \$2M.
- Over eighty-five (85) publications in peer-reviewed journals / conferences. *Google Scholar* h-index = 27.
- Reviewer for ten (10) international leading research journals in the field.
- Currently advisor (thesis/project) of six (6) UMass Dartmouth graduate (MS, PhD) students.
- Nearly fifty (50) completed Master's Theses/Projects advised at UMass Dartmouth.
- Assistant Professor, Natural Science Division, Long Island University NY (2000-2004).
- Ph. D. Thesis (Summer 2000).

### **Technical Experience**

- Extensive programming experience in several environments and frameworks on Linux/Mac. *Fortran, C/C++, Java, Mathematica, Matlab, Python, OpenMP, OpenMPI, CUDA, OpenCL.*
- Expertise in high-performance, cluster, grid and GPU-computing. Developer of open-source software for scientific computing for the Mac <http://hpc.sf.net/>. Creator of the *OpenMacGrid* and *PlayStation 3 Gravity Grid*.

### **Teaching Experience**

- Research advisor of several graduate and undergraduate students at UMass Dartmouth.
- Teaching wide variety of undergraduate and graduate Physics courses at UMass Dartmouth. Developed new courses on relativity and black holes.
- Received awards and honors for teaching ability.
- Taught Physics and Mathematics at Long Island University, Southampton. Advised several Technology Co-op projects at the on-campus Technology Center.
- Teaching Assistant in the Physics Department at Penn State.

### **Selected Recent Media Coverage**

- The Verge (2019), *The rise and fall of the PlayStation supercomputers*
- Physics Buzz (2019), *Gargantua: The Science behind Interstellar's black hole*
- Forbes (2018), *Physicists Reconsider The Existence Of Extreme Black Holes Once Thought To Be Impossible*
- HPCWire (2016), *Alternative Supercomputing or How to Misuse a Computer*
- Phys.org (2015), *A supercomputer in the palm of your hand*
- New York Times (2014), *That Old PlayStation Can Aid Science*

### **Selected Publications**

- Physics related publications may be found on the arXiv: <https://bit.ly/3bm8yKb>