

Curriculum Vitae - Mirley K. Balasubramanya

Education

Indian Institute of Technology, Kanpur, India
Iowa State University, Ames, Iowa

M.Sc.(Integrated) - Physics
Ph.D. - Physics

Appointments

**Professor & Department Chair of Mathematical, Physical, and Engineering Sciences, and
Director of Innovation and Industry Partnerships, 2020-Present,
Dean, College of Arts & Sciences, 2012-2020,
Department Chair of Science and Mathematics, (2012-2016)
Texas A&M University-San Antonio (A&M-SA), Texas**

**Professor of Physics and Department Chair of Physical and Environmental Sciences, 2008-
2012, Associate Professor of Physics and Physics Program Coordinator, September 2002-08,
and Assistant Professor of Physics and Physics Program Coordinator, 1994-2001,
Texas A&M University-Corpus Christi (TAMUCC), Texas**

**Visiting Assistant Professor of Physics, 1993-94, Hamilton College, Clinton, New York
Visiting Assistant Professor of Physics, 1992-93, Carleton College, Northfield, Minnesota**

Publications

- [1] "Predicted Anomalous Behavior of C60 Fullerenes on Graphite at Low Temperature: A New Hindered Cooperative Rotational Transition," *M. W. Roth, M. K. Balasubramanya, P. Bergmann, M. Karl, M. J. Connolly, and Paul A. Gray*
J. Comput. Theor. Nanoscience **8**, 795 (2011).
- [2] "The action variable and frequency of a relativistic harmonic oscillator," M.K. Balasubramanya, *Theoretical and Mathematical Physics*, **162** (3), 341 (2010).
- [3] "Molecular dynamics simulations of noble gas release from endohedral fullerenes due to cage disintegration," M.K.Balasubramanya, M.W.Roth, P.D.Tilton and B.A.Suchy, *Journal of Computational and Theoretical Nanoscience* **5** (4), 627 (2008).
- [4] "Distributed departments: A new approach to predicting the vitality of small programs – I: Managing the department," D.J.Suson, P.H.Cox, L.D.Hewett, H.J.Leckenby, J.Espinosa, P.Fisher, D.Craig, D.K.Marble, M.K.Balasubramanya, O.Gonzalez, Q.Ni, and V.L.Willson, *Journal of Science Education and Technology* **17**(6) 595 (2008).
- [5] "Quantum Hamilton-Jacobi theory: The case of the weakly relativistic oscillator," M.K. Balasubramanya, arXiv:quant-ph/0702106v1.
- [6] "Simulated dynamics of Ne@C60 clusters beyond dissociation," P.D.Tilton, B.A.Suchy, M.K.Balasubramanya, and M.W.Roth, *Molecular Simulations* **33** (11), 945 (2007).
- [7] "Creating a distributed physics department," M. K. Balasubramanya, P. H. Cox, L. D. Hewett, H. Leckenby, D. J. Suson, J. Espinosa, O. Gonzalez, Q. Ni, P. J. Lawrence, D. K. Marble, and V. L. Willson, *American Journal of Physics* **72** (3), 359 (2004).
- [8] "Calculated phase boundary including corrugation effects for krypton layers physisorbed onto spherical substrate," M.K.Balasubramanya and M.Roth, *Physical Review B* **63**, 205425 (2001).
- [9] "Predicted properties and melting transition of krypton layers physisorbed onto Lennard-Jones spheres," M.Roth and M.K.Balasubramanya, *Physical Review B* **62**, 17043 (2000).

Patents (Jointly with Quantum Industrial Development Corporation, 2013-Present)

Mark A. Junio, Terry R. McCauley, Joseph S. McDowell, Victoria A. Watson, Mirley K. Balasubramanya, "Thermoelectric heat energy recovery module generator for application in a Stirling-electric hybrid automobile," U.S. Patent # 10,876,456, Issued Dec 29, 2020.

Joseph S. McDowell, Mirley K. Balasubramanya, Kevin M. Chandler, Harold J. Idell, "Computer controlled solid state switching device for electrical system in a Stirling-electric hybrid vehicle," (U.S. Patent disclosed)

Select Presentations

"Two forms of the action variable in *Quantum Mechanics*," M.K.Balasubramanya, Invited, TAMU-Princeton-Baylor Summer Symposium on Quantum Science and Engineering, July 23-29, 2017, Casper, Wyoming; "*The Lennard-Jones oscillator in quantum Hamilton-Jacobi theory*," Balasubramanya M.K., Roth M.W., 9th Annual Meeting of the Northwest Section of the American Physical Society, May- 17-19, 2007, Pocatello, Idaho; "*Some Experiments for a Distance-Education Laboratory Physics Course*," 129th American Association of Physics Teachers National Meeting, July 31-Aug. 4, 2004. Sacramento, California; "*Paradoxes in Classical Electrodynamics*," Invited, Rhode Island College, March 1994, Providence, Rhode Island.

Undergraduate Courses Taught

General Physics, University Physics, Physics for Nursing and Health Sciences, College Algebra, Medical Physics, Classical Mechanics, Classical Electrodynamics, Modern Physics, Atomic and Molecular Physics, Nuclear and High Energy Physics, Mathematical Methods in Physics, Quantum Mechanics, and Professional Ethics in Science and Technology.

Student Mentoring

Graduate Committees: Served on 4 Computing and Mathematical Sciences graduate committees on graduate projects involving physics at TAMUCC: (1) Charles McCauley (Late), Mathematics, "Mathematical modeling of biological information processing: The extracellular potentials and fields of a Gaussian wave action potential for a neural volume conductor," May 1997, (2) Desiree Trujillo, Mathematics, "Accuracy of surface current velocity measurements obtained from HF radar in Corpus Christi Bay, Texas," May 2004, (3) Amit Gandhi, Computer Science, "Computer assisted learning of thermodynamics," August 2000, (4) Srikanth Turaga, Computer Science, "Online multiple version quiz creation on optics with self adjusting figures," August 2004.

Undergraduate Menoring: (1) 7 undergraduate student research projects on quantum physics, at Iowa State University, (2) 4 undergraduate students on sustainable energy resources, and 9 undergraduate students on molecular dynamics simulations, at TAMUCC.

Select Synergistic Activities

[1] **Coordinator for Texas Electronic Coalition for Physics at Texas A&M University-Corpus Christi** (TAMUCC), **PI for TAMUCC on the US Department of Education project:** "*Texas Electronic Coalition for Physics*" to support upper division physics course development for distance education, \$50,000 (2001-2005). [2] **PI for NSF project** at TAMUCC: "*RUI- Development of a Cluster System to Support Computational Science Research*," \$400,000, (September 1, 2003 – August 31, 2007), and **Co-PI for NSF project** at TAMUCC: "MRI-R2: Development of Hyperspectral Optical Property Instrumentation (HOPI) for Biomedical and Environmental Research," \$524,171, (March 1, 2010 - February 28, 2013). [3] **PI** for the "SHV Technology Project", Sponsored by Quantum Industrial Development Corporation (September 2013-Present). [4] **Contributions to Text Book Publishing:** Created new questions for 6 chapters of the text *Physics for Scientists and Engineers*, 6th edition, by Tipler and Mosca, W.H.Freeman, New York (2007); Reviewed 3 chapters of the text *Learning Physics*, by Birkett and Elby, John Wiley& Sons, New York (2004). [5] **Session Chair:** Session on "Vacuum Energy and Casimir Effect" of the International Workshop on Semiclassical Approximation and Vacuum Energy, Texas A&M University, College Station, Texas, January 13, 2005; Session on "Atomic, Molecular, Optical and General Physics" at the 2008 Joint Spring Meeting of the Texas Sections of the American Physical Society and the American Association of Physics Teachers, March 6-8, 2008, Corpus Christi, Texas; Session on "Nanoscience and Solid State Physics" at the 2013 Joint Spring Meeting of the Texas Sections of the American Physical Society and the American Association of Physics Teachers, April 4-5, Stephenville, Texas; Session on "Current Advances in Lasers", 3rd International Conference on Current Developments in Atomic, Molecular, Optical, and Nano Physics, New Delhi, India. (December 2011). [6] **Member, Organizing Committee**, 2008 Joint Spring Meeting of the Texas Sections of the American Physical Society and the American Association of Physics Teachers, March 6-8, 2008, Corpus Christi, Texas. [7] **Reviewer** for *Foundations of Physics*. [8] **NSF Panel Member** on *The Presidential Awards for Excellence in Mathematics and Science Teaching* (PAEMST), July 2012, August 2014, July 2015, July 2016, and July 2017.