# BIOGRAPHICAL SKETCH

## James M. McDonough

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## A. Professional Preparation

BS Aeronautical-Astronautical Engineering, Ohio State University (1968)

MA Applied Mathematics, University of California, Los Angeles (1975)

PhD Engineering, University of California, Los Angeles (1980)

## B. Appointments

1999–pres.: Professor, University of Kentucky, Lexington, KY

1990–1999: Associate Professor, University of Kentucky, Lexington, KY

1983–1990: Adjunct Assistant Professor, University of California, Los Angeles, CA

1980–1983: Visiting Lecturer, University of California, Los Angeles, CA

1980–1987: Member of the Technical Staff, The Aerospace Corporation, El Segundo, CA

1977–1980: Graduate Research Assistant, University of California, Los Angeles, CA

1973–1976: Staff Mathematician, Prose, Inc., Los Angeles, CA

1968–1972: Engineer/Scientist, McDonnell Douglas Astronautics Co., Santa Monica, CA

## C. Publications

### Papers Related to Proposed Research

McDonough, J. M., Mukerji, S. and Chung, S., A Data-Fitting Procedure for Chaotic Time Series, *Appl. Comput. Math.* **95**, 219–243, 1998.

McDonough, J. M., Bible, S. A. and Scoville, J. Response to strain rate in a discrete dynamical system model of the high-wavenumber Navier–Stokes equations, *J. Turbulence* **4**, 2003.

McDonough, J. M. and Huang, M. T., A 'poor man's Navier–Stokes equation': derivation and numerical experiments—the 2-D case, *Int. J. Numer. Meth. Fluids* **44**, 545–578, 2004.

Yang, Tianliang, McDonough J. M. and Jacob, J. D., 2-D 'Poor Man's Navier–Stokes Equation' Model of Turbulent Flows, *AIAA J.* **41**, 1690–1696, 2003.

McDonough J. M. Three-dimensional poor man's Navier–Stokes equation: A discrete dynamical system exhibiting $k^{-5/3}$ inertial subrange scaling, *Phys Rev E.* **79**, 065302(R), 2009.

## C. Publications (Cont.)

### Other Publications

Majda, A., McDonough, J. M. and Osher, S., The Fourier Method for Non-Smooth Initial Data, *Math. Comp.* **32**, 1041, 1978.

Lee, C. K. B., McDonough, J. M. and Huang, M. T., Dimension Calculations for Low Flow Rate Steam Injection Experiments, *Phys. Fluids* **29**, 2843, 1986.

Heister, S. D., McDonough, J. M., Karagozian, A. R. and Jenkins, D. W., The Compressible Vortex Pair, *J. Fluid Mech.* **220**, 339, 1990.

Lee, C. K. B. and McDonough, J. M., Implementation of a Nonlinear Filter with a Lagrangian Formulation for the Treatment of Very High Pressure Reflected Shocks, *J. Comput. Phys.* **117**, 289, 1995.

McDonough, J. M., On Intrinsic Errors in Turbulence Models Based on Reynolds-Averaged Navier–Stokes Equations, *Int. J. Fluid Mech. Res.* **22**, 27–55, 1995.

## D. Synergistic Activities

(i) Mentoring of high school students from a local Math/Science Magnet Program in the use of computational fluid dynamics.

(ii) Member of various professional organizations (for example, *SIAM*, *AMS*, *APS*, *AIAA*; reviewer for numerous archival journals and NSF and NASA proposals; member of organizing committee for the yearly international conferences, *Parallel CFD*.

## E. Collaborators and Other Affiliations

(i) **Collaborators:** P. D. Hislop (University of Kentucky Department of Mathematics); S. Bailey (University of Kentucky Department of Mechanical Engineering).

(ii) **Graduate Advisor:** Ivan Catton, UCLA

(iii) **Thesis Advisor and Post-Graduate Scholar sponsor:** S. A. Bible (Flow Tack LLC, Morrisville, NC),Y. Chen, V. E. Garzon (unknown), E. C. Hylin (Univ. of Nevada, Reno), I. Kunadian (PhD student University of Kentucky), S. Mukerji (Kohler, Inc. Kohler, WI), L. Wang, D. Wang (unknown), D. C. Weatherly (Lexmark, Lexington, KY), Y. Yang (Proctor & Gamble, Cincinnati, OH), T. L. Yang (unknown), Y. Xu (Michigan State University, East Lansing, MI), C. B. Velkur (General Electric Corp. India); A. Tiwari (unknown); J. Polly, J. Strodtbeck, Paul Zhang (current graduate students).

Total of 16 graduate students and a Post-Doctoral Scholar.