



Paul Durbin

Professor

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Education

Ph.D. Applied Mathematics and Theoretical Physics, University of Cambridge, 1979

B. S. Aerospace and Mechanical Science, Princeton University, 1974

Academic Appointments

Iowa State University (2005-present)

Department of Aerospace Engineering

- *Professor*, August 2005 – present
- *Joseph C. and Elizabeth A. Anderlik Professor of Engineering*, 2019-present
- *Martin C Jischke Professor (inaugural)*, 2005-2015

Stanford University

Department of Mechanical Engineering

- *Professor*, 1996-2005

Awards and Honors

- Fellow American Physical Society.
- Outstanding research award, ISU Aero Department.
- Distinguished paper award, NASA Lewis Research Center.

Teaching

UNDERGRAD: AerE 311, Compressible flow, AerE446 Computational Fluid Dynamics, ME 335 Fluid Mechanics.

GRADUATE: AerE 541 Incompressible Flow, AerE546 Computational Fluid Dynamics, AerE572 Turbulence, AerE640 Fluid Dynamical Stability.

Research

Interest Areas:

- Turbulence: ▪Closure modeling; ▪High fidelity simulation; ▪Hybrid modeling; ▪ Rapid Distortion Theory
- Fluid Dynamic Stability and Transition: ▪Bypass transition; ▪High fidelity simulation; ▪Predictive modeling

Sponsored Grants: ONR, AFOSR, ARO, NASA, NSF, GE, Pratt &Whitney

Selected Publications (of 190 pubs. including 120 journals, 8 book chapters, 2 books, 60 conf. proceedings; h-index 48)

1. Biswas, R, **Durbin, P.A.**, Medic, G. (2019). Development of an elliptic blending lag k- ω model, *Int. J. Heat Fluid Flow*, 76, pp. 26-39.
2. Matai, R., **Durbin, P.A.** (2019). LES of turbulent flow over a parametric set of bumps, *J. Fluid Mech.*, 866, pp. 503-525.
3. **Durbin, P.A.** (2018). Recent developments in turbulence closure modeling, *Ann. Rev. Fluid Mech.*, 50, pp. 77-103.
4. Ismail, U., Zaki, T.A., **Durbin, P.A.** (2018). Simulations of rib-roughened rough-to-smooth turbulent channel flows *J. Fluid Mech.*, 843, pp. 419-449.
5. **Durbin, P.A.** (2017). Perspectives on the phenomenology and modeling of boundary layer transition, *Flow, Turbulence and Combustion*, 99, pp.1-23.
6. Bose, R. & **Durbin, P.A.** (2016). Evidence of helical breakdown in transitional boundary layers *Phys. Rev. Fluids*, 1, p. 073602.
7. Yin, Z. & **Durbin, P.A.** (2016). An Adaptive DES Model that Allows Wall-Resolved Eddy Simulation, *Int. J. Heat Fluid Flow*, 62, pp. 499-509.
8. Rudra Reddy, K. Ryon, J. A. & **Durbin, P.A.** (2014). A DDES model with a Smagorinsky-type eddy viscosity formulation and log-layer mismatch correction, *Int. J. Heat Fluid Flow*, 50, pp. 103-113.
9. Ge, X. Arolla, S. & **Durbin, P.A.** (2014). A bypass transition model based on the intermittency function, *Flow Turb. & Combustion*, 93, pp. 37-61.
10. Huang, X & **Durbin, P.A.** (2012). Particulate mixing in a turbulent serpentine duct, *Phys. Fluids*, 2, p. 013301.
11. **Durbin, P.A.** & Pettersen-Reif, (2010). *Statistical Theory and Modeling for Turbulent Flows*, 2nd ed., John Wiley, ISBN: 978-0-470-68931-8.

Thesis Advisor/Co-advisor and Postgraduate-Scholar Sponsor

Postgraduate-Scholar (14) Doctoral (22) Masters (4)

Professional and Outreach Activities

- AIAA, ASME – Member;
- Scientific Committees of Conferences: International (4);
- Session Chairs at Conferences: *APS-DFD, AIAA, ETMM*;
- Editorial Board Member of 5 Journals; *Flow Turbulence and Combustion, ASME J. Fluids Eng.*;
- Reviewer: Many Journals, NSF, NASA, NSERC (Canada), Israel Science Foundation, PRACE (Europe);
- Other: NASA advisory panels, consultant to aircraft engine and CFD companies.