

UNIVERSITY OF WASHINGTON

Name: Robert Edward Breidenthal, Jr.

Department: Aeronautics and Astronautics

Date of Birth: October 9, 1951

Academic Positions: Post-Doctoral Research Fellow, Caltech - 1978-1980
Research Assistant Professor, UW- 1980-1983
Assistant Professor, UW - 1983-1987
Associate Professor, UW - 1987-1997
Professor, UW - 1997-

Degrees: B.S.A.E., Wichita State University, 1973
M.S., California Institute of Technology, 1974
Ph.D., California Institute of Technology, 1979

Number of Years Service on this Faculty: 28 years: August 1, 1980

Full-time Industrial: Boeing Aerospace Company, summer 1983
Asea Brown Boveri, Switzerland, summer 1989

Consulting Work: Boeing Aerospace Company, Flow Research, U.S. Gypsum, Arco Alaska, R
CH2M Hill, Airlift Northwest, Rangehut, Cessna
Aircraft, DB Western, Viper Tee, PACCAR.

Scientific and Professional Societies of which a Member: American Physical Society, American Institute of Aeronautics and Astronautics

Honors and Awards: Sigma Gamma Tau, 1972
Tau Beta Pi, Academic Honors, Wichita State University, 1969-73
Valedictorian, 1973
Earl R. Hutton Scholarship in Aeronautical Engr., 1969-73
National Science Foundation Graduate Fellowship, 1973-76
Donald W. Douglas Graduate Fellowship in Aero. 1973-78
Outstanding Professor Award, AA Dept. (co-winner) 1994
Tan Chin Tuan Visiting Professor, NTU, Singapore 2005

Courses Taught at U of W:	Gen. Studies 197F	Freshman Seminar
	Engr. 260	Thermodynamics
	AA 210	Statics
	AA 311, 301, 302	Aerodynamics I, II, III
	AA 320,1,2	Junior Laboratory I, II, III
	AA 402	Fluid Mechanics
	AA 441	Flight Test Engineering
	AA 504	Fluid Mechanics
	AA 505	Inviscid Flow I
	AA 506	Inviscid Flow II
AA 508	Turbulence	

Publications:

Chemically reacting, turbulent shear layer, R.E. Breidenthal, Ph.D. Dissertation, 1978.
Also published in 1979 *AIAA J.* **17**(3) 310-311.

On the development of three-dimensional small scales in turbulent mixing layers, L.P. Bernal, R.E. Breidenthal, G.L. Brown, J.H. Konrad, & A. Roshko 1979 *2nd Symposium on Turbulent Shear Flows*, London.

Response of plane shear layers and wakes to strong three-dimensional disturbances, R.E. Breidenthal 1980 *Phys. Fluids* **23**(10) 1929-1934.

Reacting flow visualization of a turbulent shear layer and wake, R.E. Breidenthal 1980 Proc. *2nd International Symposium on Flow Visualization*, Bochum, W. Germany, Hemisphere Publishing, September 1980, 687-704.

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A simple model of mixing and chemical reaction in a turbulent shear layer, J.E. Broadwell & R.E. Breidenthal 1982 *J. Fluid Mech.* **125** 397-410.

Structure and mixing of a transverse jet in incompressible flow, J.E. Broadwell & R.E. Breidenthal 1984 *J. Fluid Mech.* **148** 405-412.

The effects of turbulent mixing in clouds, M.B. Baker, R.E. Breidenthal, T.W. Choulaton, & J. Latham 1984 *J. Atm. Sci.* **41** 299-304.

Laser-driven shock fragmentation of renal calculi, D.A. Russell, R.D. Brooks, & R.E. Breidenthal 1984 *Seventh International Conference on Lasers and Applications*, San Francisco.

Turbulent mixing in tubes with transverse injection, A.C. Edwards, W.D. Sherman, and R.E. Breidenthal 1985 *A.I.Ch.E. J.* **31** 516-518.

- Turbulent mixing in two-dimensional ducts with transverse jets, R.E. Breidenthal, K.-O. Tong, G.S. Wong, R.D. Hamerquist & P.B. Landry 1985 AIAA-85-1600, Cincinnati, Ohio, and 1986 *AIAA J.* **21**(11), 1867-1869.
- On entrainment at stratified interfaces, R.E. Breidenthal & M.B. Baker 1985 *Seventh Symposium on Turbulence and Diffusion*, Boulder, Colorado, November 12-15, 1985.
- Convection and entrainment across stratified interfaces, R.E. Breidenthal & M.B. Baker 1985 *J. Geophys. Res.* **90** 13055-13062.
- The turbulent exponential jet, R.E. Breidenthal 1986 *Phys. of Fluids* **29**(8) 2346-2347.
- On turbulent mixing in nonsteady jets, S.M. Kato, B.C. Groenewegen, & R.E. Breidenthal 1987 *AIAA J.*, **25**(1) 165-168.
- An outline of the physics of the Dornier lithotripter and some possible alternatives, W. Chapman, D.A. Russell, R.D. Brooks, M. Mayo, and R.E. Breidenthal 1987 *New Techniques in Urology*, Futura Publishing Co., New York, 63-71.
- Alternative forms of extracorporeal shock-wave lithotripsy (ESWL), W.H. Chapman, M.E. Mayo, B.F. Norton, R.D. Brooks, & R.E. Breidenthal 1987 *Stone Disease: Diagnosis and Management*, Grune and Stratton Inc., New York **187** 311-320.
- Alternative extracorporeal shock-wave lithotripters, and Laser-generated extracorporeal shock wave lithotripter, M.E. Mayo, W.H. Chapman, R.D. Brooks, & R.E. Breidenthal 1987 Chapters 4 and 5 in *State of the Art Extracorporeal Shock Wave Lithotripsy*, Futura Publishing Co., New York, 73-95, 97-110.
- Turbulent mixing in accelerating jets, R.E. Breidenthal 1987 *Turbulence Management and Relaminarization, IUTAM Symposium Bangalore/India*, H.W. Liepmann and R. Narasimha, (Eds.) Springer-Verlag.
- Chemically reacting thermals with buoyancy reversal, H. Johari & R.E. Breidenthal 1987 *Third International Symposium on Stratified Flow*, Caltech, February 3-5, 1987.
- Turbulent mixing in buoyant flows, H. Johari & R.E. Breidenthal 1987 *Proceedings of the International Conference on Fluid Mechanics*, Beijing, China, July 1-4, 1987, 134-139.
- A comparative study of laboratory thermals and atmospheric clouds, H. Johari, G. Taylor, M. Baker, & R.E. Breidenthal 1988 *Preprints of the 10th International Cloud Physics Conference*, Bad Hamburg, Germany, August 15-20, 1988, 67-69.
- Laboratory experiments on the cloud-top entrainment instability, S. Shy & R.E. Breidenthal 1990 *J. Fluid Mech.* **214** 1-15.

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- Temperature transients in a cylindrical pressure vessel filled from vacuum, D.R. Dowling, V.R. Buonadonna, & R.E. Breidenthal 1990 *AIAA J. Thermophysics and Heat Transfer* **4**(4) 504-511.
- Mixing of jets in confined volumes, R.E. Breidenthal, V.R. Buonadonna, & M.F. Weisbach 1990 *J. Fluid Mech.* **219** 531-544.
- On entrainment and detrainment across a stratified interface, S. Shy & R.E. Breidenthal 1990 *Preprints of the 1990 Conference on Cloud Physics*, San Francisco, July 17-23, 1990, American Meteorological Society, 65-69.
- On aircraft produced ice particles (APIPS) in supercooled clouds and the mechanism responsible for their production, W.L. Woodley, T.J. Henderson, B. Vonnegut, G. Gordon & R.E. Breidenthal 1991 *J. Applied Meteorology* **30** 1469-1488.
- Effects of periodic disturbances on structure and flame length of a jet in a cross flow, A. Eroglu & R.E. Breidenthal 1991 AIAA-91-0317, Reno.
- Turbulent Stratified Interfaces, S. S. Shy & R.E. Breidenthal 1991 *Phys. Fluids A* **5**(2) 1278-1285, and *Proceedings IUTAM Symposium of Fluid Mechanics of Stirring and Mixing*, UCSD, La Jolla, CA, 1990.
- A new type of telescope flow control - The unclosure, S. Limmongkol & R.E. Breidenthal 1991 *Publications of the Astronomical Society of the Pacific*, **103** (664) 582-586.
- Sonic eddy - A model for compressible turbulence, R.E. Breidenthal 1992 *AIAA J.* **30**(1) 101-104, and AIAA-90-0495, Reno, Nevada, January 1990.
- Entrainment at thin stratified interfaces: The effects of Schmidt, Richardson, and Reynolds numbers, R.E. Breidenthal 1992 *Phys. Fluids A* **4**(10) 2141-2144.
- Simple models of stratified and compressible entrainment," R.E. Breidenthal 1993 *Proceedings of the 4th International Workshop on the Physics of Compressible Turbulent Mixing*, Cambridge, England, Cambridge University Press, March 29-April 1, 1993.
- Entrainment and mixing in stratified flows, R.E. Breidenthal 1994 *Applied Mech. Rev.*, **47**(6), part 2, S108-S112.
- Persistence theory of stratified entrainment, A. J. Cotel & R.E. Breidenthal 1994 *Preprints of the Fourth International Symposium on Stratified Flows*, **4** Grenoble, France, June 29-July 2, 1994.

Flow into a black hole,” D. Tordella & R.E. Breidenthal 1996 *Int. J. Modern Phys. A*, **11**(1) 161-170.

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Addressing complexity in laboratory experiments: The scaling of dilute multiphase flows in magmatic systems, A. Burgisser, G.W. Bergantz, & R.E. Breidenthal 2005 *Journal of Volcanology and Geothermal Research* **141** 245-265.

Elements of entrainment, R.E. Breidenthal 2006 *Turbulencia, Escola de Primavera em Transicao e Turbulencia*, ed. A.P. Silva Freire, A. Ilha, and R.E. Breidenthal, ABCM, Rio de Janeiro, **5**(2) 205-221.

The effect of acceleration on turbulent entrainment, R.E. Breidenthal 2008 *Physica Scripta T* **132** 014001.