Amy Warncke Lang

EDUCATION

Ph.D., Aeronautics (1997), California Institute of Technology, Pasadena, CA
• Concentration in Experimental Fluid Mechanics
• Minor in Environmental Engineering Science
• Research funded by Office of Naval Research
• Ph.D. Thesis Title: The effects of surfactants on free-surface flows
• Ph.D. Thesis advisor: Mory Gharib

M.S., Aeronautics (1994), California Institute of Technology, Pasadena, CA

B.S., Mechanical Engineering (1993), Michigan State University, East Lansing, MI
• Graduated second in class of Mechanical Engineering
• Graduated with High Honor from the Honors College
• Member of Honor Societies -- Tau Beta Pi, Pi Tau Sigma, and Phi Kappa Phi
• Spent third term of junior year abroad at RWTH Aachen, Germany
• Undergraduate Research Advisor: Manooch Koochesfahani

PROFESSIONAL CAREER

1997-2005
• Assistant Professor in the Department of Aerospace and Mechanical Engineering at Parks College of Engineering and Aviation, Saint Louis University

2005-present
• Assistant Professor in the Aerospace Engineering and Mechanics Department at the University of Alabama
• Filed for one full patent and two provisional patents on microgeometries for boundary layer control.

CONTRACTS/GRANTS

• "Lambert-St. Louis Test Site in Conjunction with St. Louis University: Student Position" $17,300 with Volpe/FAA (July 2003 – December 2004).
• NSF SGER and REU supplement grant entitled "A Biomimetic Microgeometry for Boundary Layer Control", $58,499 (July 2006 – December 2007).
•"Reducing the Drag over Aircraft by Mimicry of the Shark Skin", PI: Lang, A., Lindbergh Foundation for $10,580 (7/2007-6/2008).
• "REU Site: Fluid Mechanics with Analysis using Computations and Experiments (FM-ACE)", PI; Lang, A. Co-PI: Zeiler, T. National Science Foundation, $300,000 (4/1/08-3/31/11)
• "Reducing the Drag over Aircraft by Mimicry of the Shark Skin", PI: Lang, A., Lindbergh Foundation, $10,580 (11/2008-10/2009).
• "Microgeometries for Boundary Layer Control", PI: Lang, A., Alabama Space Grant Consortium / NASA EPSCoR ,$30,000. *(6/1/08-5/31/10).*

PUBLICATIONS

• "Bristled shark skin: a microgeometry for boundary layer control?", Lang, A., Hidalgo, P. Motta, P. & Westcott, M., *Bioinspir. Biomim*. Vol. 3, 2008, 046005
• "The Shark Skin Effect", A. Lang, book chapter, submitted in May 2008 to be published in Functional Properties of Biological Surfaces: Characterization and Technological Applications
• "On the Interaction of Water Waves with a Surface-Parallel Vortex", A.W. Lang, & W. Thacker*, ASME Journal of Fluids Engineering, Vol*. 130, 2008, 051302:1-7
• "An Experimental Study of the Effect of Grid Turbulence on Shear Layer Evolution", A. W. Lang & B. Gomez, *ASME Journal of Fluids Engineering,* Vol. 126, 2004, pp.286-290
• "An Experimental Study of a Turbulent Shear Layer at a Clean and Contaminated Free-Surface", A. W. Lang & C.E. Manglano, *Experiments in Fluids*, Vol.36, 2004, pp.384-392
• "Experimental Study of the Wake Behind a Surface-Piercing Cylinder for a Clean and Contaminated Free Surface," A. Warncke Lang & M. Gharib, *Journal of Fluid Mechanics,* Vol. 402, 2000, pp.109-136
• "Fluid Surface Imaging Using Microlens Arrays," T. Roesgen, A. Lang, & M. Gharib, *Experiments in Fluids*, Vol. 25 (2), 1998, pp.126-132
• "Vortex Ring Generation Due to the Coalescence of a Water Drop at a Free Surface," B. Dooley, A. Warncke, M. Gharib, & G. Tryggvason, *Experiments in Fluids*, Vol.22 (5), 1997, pp. 369-374
• "Flow Measurements Near a Reynolds Ridge," A. Warncke, M. Gharib, & T. Roesgen *ASME Journal of Fluids Engineering*, Vol. 118, September 1996, pp. 621-624

COURSES TAUGHT

Fluid Mechanics, Gas Dynamics, Graduate Fluid Dynamics, Thermodynamics, Applied Thermodynamics, Measurements, Aerospace Laboratory, Propulsion, Freshman Engineering

RESEARCH INTERESTS

Experimental fluid dynamics with a focus on free-surface flows, vortex dynamics, free shear flows and boundary layers. Roughness effects on boundary layers with particular respect to microgeometries that can lead to drag reduction or enhancement and/or separation control. Current/recent projects have focused on replicating bristled shark skin for hydrodynamic testing to better understand its boundary layer control capabilities.

HONORS AND AWARDS

• Lindbergh Foundation Grant Recipient (2007 & 2008)
• Research Advisory Committee (RAC) grant at University of Alabama (2006)
• Beaumont Faculty Development Fund Award from St. Louis University (1998 & 2001)
• Summer Research Award from Saint Louis University (1999)
• National Science Foundation Graduate Research Fellowship (1993-1996)
• Zonta International Amelia Earhart Fellowship (1994)
• GE Minority Summer Research Award (1992)