

# Boster, Kobayashi & Associates

---

59 Rickenbacker Circle  
P.O. Box 2049  
Livermore, CA 94551-2049

Office: (925) 447-6495  
Fax: (925) 447-6589

## SUSAN M. BOWLEY, Ph.D.

### Curriculum Vitae

#### **EDUCATION:**

Ph.D. Biomedical Engineering, University of Virginia, 2000

Dissertation Research Topic: Age-related Differences in Physical Activity Level and Bone Density in Humans.

Student Fellowship Award: Mazess Student Fellowship from the National Osteoporosis Foundation Awarded for Dissertation research from 7/1/98 to 11/1/98

M.S. Mechanical Engineering, Stanford University, 1992

Area of Concentration: Thermosciences

Independent Study Project: Development and calibration of a device to measure transpired epidermal water loss (TEWL) from premature infants related to understanding Sudden Infant Death Syndrome (SIDS).

B.S. Mechanical Engineering, University of Connecticut, 1988

Group leader for senior project: Developed a self-contained vehicle to traverse through a column of Styrofoam packing peanuts (competed against 20 student groups).

#### **PRESENT POSITION:**

Boster, Kobayashi & Associates, Livermore, CA

Associate of Boster, Kobayashi & Associates, a consulting firm specializing in the technical aspects of accident reconstruction and highway design. Typical assignments involve application of the laws of physics and principles of biomedical engineering in accident reconstruction, premises liability and injury causation.

#### **PROFESSIONAL SOCIETY MEMBERSHIPS:**

American Society for Testing and Materials (ASTM) Member and Primary FDA Liaison to ASTM F04.30.06 Interventional Cardiology Task Group and Task Group Co-Chair 2005 - 2006

American Society of Biomechanics (ASB) 1997 - present

Biomedical Engineering Society (BMES) 1993 - present

American Society of Mechanical Engineers (ASME) 1984 - present

**PREVIOUS POSITIONS:**

Food and Drug Administration (FDA), Center for Devices and Radiological Health  
Rockville, Maryland

Mechanical/Biomedical Engineer – Reviewer - November 2002 – July 2006  
Interventional Cardiology Devices Branch, Division of Cardiovascular Devices

Served as lead medical device reviewer within the Interventional Cardiology Devices Branch in the Office of Device Evaluation (ODE) for cardiovascular medical devices. Reviews predominantly involved pre-IDEs, IDEs, and to a lesser extent 510k and PMA submissions from the medical device industry. The vast majority of responsibilities involved engineering reviews of drug eluting stents and standards development activities for both the Interventional Cardiology Devices and the Peripheral Vascular Devices Branches. Served as Primary FDA Liaison to ASTM F04.30.06 Interventional Cardiology Task Group and as Task Group Co-Chair during 2005 – 2006.

ORISE Post Doctoral Fellow - June 2001 – November 2002  
Hydrodynamics and Acoustics Branch, Division of Physical Sciences

Performed basic research to objectively study the amount of red blood cell damage (hemolysis) caused by medical devices in order to better predict hemolysis. One type of device studied was the class of roller pumps used in cardiopulmonary bypass surgery. Other studies involved determination of a reliable bench-top blood fragility tester. Laboratory studies will be continued into the future and be complemented with PIV flow visualization and Fluent FEM of several blood damage models.

George Washington University  
Washington, D.C.

Part-time Faculty - 2006 Spring Semester  
Mechanical and Aerospace Engineering Department

Developed and taught a new course for undergraduates, Biomechanics I, focusing on structural biomechanics in humans, plants, and animals.

Montgomery College (Community College)  
Germantown, Maryland

Part-time Faculty - 2004 and 2005 Spring Semesters  
Mathematics, Science, Physics and Engineering Division

Taught Physical Science 101, a laboratory based science course for non-science majors. Responsible for teaching and development of lectures, discussion and laboratory sessions.

**PREVIOUS POSITIONS:** (continued)

National Aeronautics and Space Administration, Ames Research Center  
Moffett Field, California

Mechanical/Biomedical Engineer - August 1994 – June 2001  
Musculoskeletal Biomechanics Laboratory, Life Science Division

Biomedical engineering dissertation research in the Musculoskeletal Biomechanics Laboratory involving development of a Ground Reaction Force (GRF) sensor, direction of associated human research studies, and investigation of basic aspects of musculoskeletal remodeling. Laboratory Website Mistress/Developer (<http://lifesci.arc.nasa.gov/~rwhalen>). *General:* Heat transfer analysis and development of a finite element model using COSMOS/M for a Shuttle payload. *Intercranial Pressure Research:* Instituted an improved data acquisition method within one month. Initiated evaluation of response wave form (amplitude vs. time) in intercranial pressure. Conferred with regulatory consultant in order to document testing for future FDA approval.

Acting Assistant Division Chief - September 2000 – December 2000  
Life Science Division

Administrative Activities: Represented the Life Science Division in meetings related to personnel, budget, projects, promotion and outreach. Prepared reports related to safety, ongoing projects (flight and ground based) and general information.

Full-time Graduate Study Fellowship - August 1993 - August 1994  
Biomedical Engineering Department, University of Virginia

Completed all course work required for the Ph.D. degree in Biomedical Engineering. Surpassed school of engineering requirements by passing the Foreign Language Mastery Exam for Ph.D. candidates in French.

Project Engineer - September 1992 - August 1993  
Human Powered Centrifuge Project, Life Science Division  
(Professional Development Program, Competitively Selected)

Led and managed the Human Powered Centrifuge Project. Wrote facility checkout, testing, and operation procedures. Scheduled workflow and established budgets for all phases of the project. Achieved a reduction in initial project cost estimate (estimated at over \$100,000) by recognizing and instituting a simpler and more cost effective solution.

Facility Engineer - November 1988 - September 1992  
Space Technology and Aeronautical Test and Simulation Divisions

Experience working in three different test facilities: Arc-Jet Facilities Complex, 3.5-Foot Hypersonic Wind Tunnel, 14-Foot Transonic Wind Tunnel.

**PREVIOUS POSITIONS:** (continued)

Management/General: Coordinated and determined facility related equipment to support model testing. Inspected and documented facility in order to advocate future funding allocation and planning. Coordinated and monitored various facility projects (\$100,000 - \$950,000). Wrote facility reports associated with operational readiness and accident investigations. Managed and directed through shops various facility projects and upgrades (\$5,000 - \$10,000). Coordinated engineers from other organizations in investigating and solving facility problems as appropriate. Technical: Investigated, inspected and diagnosed facility shutdown problems and accidents. Determined tunnel critical electrical devices and analyzed facility operational logic sequence. Performed various structural and heat transfer calculations. Designed an insert/retract mechanism for an oxygen sensor. Calculated makeup water required for cooling tower operation. Selected various upgrades to facility equipment including pumps, thermocouples, and valves. Special Project: Directed and managed turning vane set inspection, evaluation, and repair project (\$300,000) including scheduling and manpower.

University of Connecticut, Mechanical Engineering Department  
Fluid Mechanics Laboratory, Storrs, Connecticut

Lab Assistant - June 1984 - July 1988

Assisted graduate student in fluids lab performing research on optimization of diffusers and turbine endwalls using the ice-formation method. Testing in water and wind tunnels. Applied Helium bubble and laser induced fluorescent dye flow visualization techniques. Worked independently to test and organize data on the new diffusers. Worked with various shop tools and techniques such as the drill press, and casting the ice-formations with hot beeswax, plaster and dental material.

**PUBLICATIONS/ABSTRACTS:**

Bowley, S.M. and Malinauskas, R.A. (2003). Evaluation of Parameters Affecting Bovine Blood Hemolysis Testing. Podium presentation and abstract for the ASME 2003 Summer Bioengineering Conference, Key Biscayne, FL.

Malinauskas, R.A. and Bowley, S.M. (2002). Red Blood Cell Mechanical Fragility Tester. Abstract for the FDA Science Forum Meeting, Washington, DC.

Bowley S.M., and Whalen R.T. (2001). Physical Activity and Bone Density in Women. Podium presentation and abstract for ORS Meeting, San Francisco, CA.

Bowley S.M., Breit G.A., and Whalen R.T. (1999). Accuracy of monitoring peak force and temporal parameters of gait using a capacitance insole system. Podium presentation and abstract for ASB Meeting, Pittsburgh, PA.

Bowley S.M., Breit G.A., and Whalen R.T. (1998). Objective measurement of daily human activity. Abstract for ASBMR Meeting, San Francisco, CA.

**PUBLICATIONS/ABSTRACTS:** (continued)

Bowley S.M., Breit G.A., and Whalen R.T. (1998). Capacitance insole sensor calibration and performance tests for use in human activity monitoring. Abstract for ASB/NACOB Meeting, Waterloo, Ontario, Canada

Ariagno R.L., Glotzbach S.F., Baldwin R.B., Rector D.M., Bowley S.M., Moffat R.J. (1997). Dewpoint hygrometry system for measurement of evaporative water loss in infants. *J. Appl. Physiol.* 82(3):1008-1017.

Greenleaf J.E., Gundo D.P., Watenpaugh D.E., Mulenburg G.M., Marchman N., Looft-Wilson R., Hargens A.R., and Bowley S.M. (1996). Cycle-powered short radius (1.9m) centrifuge: Exercise vs. passive acceleration. Abstract for 17th Annual Gravitational Physiology Meeting, Warsaw, Poland.

Torikoshi S., Ballard R.E., Watenpaugh D.E., Murthy G., Bowley S.M., Yost W.T., and Hargens A.R. (1995). Measurement of transcranial distance during head-down tilt using ultrasound. Abstract for 16th Annual International Gravitational Physiology Meeting, Reno, Nevada.

Bowley S.M. (1995). The Human Powered Centrifuge Facility at NASA Ames Research Center. Abstract for AIAA Meeting, AIAA-95-3572.

**SPECIALIZED TRAINING AND EXPERIENCE:**

PC-Crash Training Workshops: Essentials and Advanced – August 13 – 17, 2007 (5 days)

MEA Forensic Engineers and Scientists Ltd, UBC Robson Square, Vancouver, BC

Training in both Essentials and Advanced topics for PC-Crash accident reconstruction software package.

Traffic Accident Reconstruction II – April 30 – May 4, 2007 (5 days)

Northwestern University Center for Public Safety, Evanston, Illinois

Sequel to Accident Reconstruction I. Traffic accident reconstruction used to determine how an accident occurred and to describe the events of an accident by use of equations of motion, momentum and energy. Case studies involved motorcycle and pedestrian accidents in addition to vehicle-to-vehicle collisions.

Traffic Accident Reconstruction I – January 15 – 26, 2007 (10 days)

Northwestern University Center for Public Safety, Evanston, Illinois

Traffic accident reconstruction used to determine how an accident occurred and to describe the events of an accident by use of equations of motion, momentum and energy.

**SPECIALIZED TRAINING AND EXPERIENCE:** (continued)

Forensic Analysis of Medical Records in Injury Biomechanics and Accident Reconstruction

October 23 - 24, 2006 (2 days)

Society of Automotive Engineers Professional Development Seminar, Troy, Michigan

Medical records and how to read them, the types of information they contain, and the insights they can provide regarding restraint usage and deployment, injury mechanism, severity and outcome, and the effects of pre-existing conditions.

Certified Nursing Assistant (CNA) since 2005

Fire Fighter since 1994

Registered Emergency Medical Technician (EMT) since 1993