

Bradley Edward Layton, MS PhD PE

8 Columbine Rd, Missoula MT, 59802

406.203.2365 (m) / blay@alum.mit.edu

EDUCATION/LICENSURE

Professional Engineer – Breadths: HVAC & Thermal Fluids Depth: Structures & Materials 2013-pres

Biomedical Engineering, PhD University of Michigan, Ann Arbor, MI 2003

Concentrations: soft-tissue modeling and experimental mechanics • neuromechanics • atomic force microscopy • diabetic neuropathy • neuroanatomy • molecular mechanics • stochastic failure analysis • endoneurial fluid pressure measurement • non-linear viscoelastic finite element analysis • mitochondrial imaging

Mechanical Engineering, MS University of Michigan, Ann Arbor, MI 1999

Concentrations: finite element modeling • quantitative physiology • dynamics • vibrations • materials • biomedical instrumentation • exoskeleton design

Mechanical Engineering, SB Massachusetts Institute of Technology, Cambridge, MA 1992

Concentrations: fluid mechanics • mechanical design • statics • materials testing • Writing Minor

PROFESSIONAL EXPERIENCE AND CREDENTIALS

Integration Energy, LLC Managing Member and acting CEO 2016 – pres

National Soc of Professional Engineers, Financial Technologies Taskforce founding member 2015 – pres

University of Montana, Missoula MT 2010 – pres

Associate Professor – Applied Computing and Engineering Technology Department 2010 – 2017

Director – Energy Technology Program, Missoula College 2010 – 2017

Affiliated Professor – Biochemistry and Biophysics, Climate Change, Environmental Studies 2010 – pres

Courses: Introduction to Energy Systems I & II • Energy Practicum • Fuel Cells • Power Systems Technology • Building Energy Efficiency • Solar Thermal and Wind Systems • Energy Finance • Solar Car Design • ASME Human-Powered Vehicle Design • Energy Internship • Electrician Helper

Human Powered Future, PLLC Founder and President 2010 – pres

Specialties: Sustainable energy consulting • biomedical engineering consulting • biomechanical engineering consulting • soft tissue injury • structural engineering expert witness • biomedical engineering expert witness

Drexel University, Philadelphia PA 2003 – 2010

Associate Teaching Professor – Mechanical Engineering and Mechanics

Affiliated Professor – Department of Neurobiology and Anatomy

Assistant Professor – Mechanical Engineering and Mechanics

Affiliated Professor – School of Biomedical Engineering, Science and Health Systems

Courses: Introduction to Engineering Design • Materials Science • Advanced Engineering Mathematics I, II & III • Mechanical Engineering Senior Design • Dynamics • Mechanoevolution

The University of Michigan, Ann Arbor MI 1997 – 2003

Postdoctoral Fellow - Radiology Department and Neuroscience Department 2003

Graduate Student Research Assistant (1997 –2003) - Mechanical Engineering | Biomedical Engineering

Georgia Business Net – Augusta, GA – Technical Assistant: TCP/IP, troubleshooting 1997

Stillwater Design – Cambridge, MA – Construction and Design Assistant: wakeless boat building 1997

Associated Design – Alexandria, VA – Junior Engineer: Environmental, thermal mechanical design 1996

Gasser Associates – Aiken, SC – Fire Protection Engineer: Savanna River Site DOE L, NFPA 1994 – 1996

Photon Research Associates – Arlington, VA – Assistant System Administrator, UNIX, DOD L 1993 – 1994

US DOE Office of Space – Washington, DC – Jr Scientist: energy systems, lunar dust mechanics 1992

Merlin Metalworks – Somerville, MA – Machinist: titanium bicycle design and machining 1990

AWARDS/FUNDING

Awards

University of Montana Sustainability Award - Faculty	2017
Energy Innovator Governor's Award for contributions to Montana's clean energy sector	2015
John Ruffatto Memorial Award for imparting practical principles in the classroom, UMontana	2014
Shell Eco-Marathon 1st Place, Solar Car Division featured in National Geographic	2011
Robert M. Caddell Award for research contributions in materials manufacturing, UMichigan	2001

Recently Funded Major Projects

"Energy Technology Education in Efficiency To Engender Energy Independence"
8/1/2014 - 7/31/2017. NSF. Role: PI. Co-PIs: Nicky Phear, Cheryl Madman. Funding: **\$727,912**

"Montana TAACCCT SWAMMEI Consortium Grant" 2013-2017. US Dept of Labor. \$25M.
Role: Energy Technology Curriculum Developer. Lead Institution: Great Falls Community College. UMontana budget: **\$1.3M**

Other Funded Major Projects 2003-2010

Three NSF grants in nanobiological mechanics **\$958,000**

Keck Foundation grant in nanofluidics **\$5M**

USDA grant in nanobiological research **\$100,000**

PA Dept of Health grant for nanotechnology neuroscience research **\$364,544**

NetScientific grant for wind turbine research and design **\$45,000**

Coulter Foundation grant for biodegradable surgical staple design **\$95,000**

NASA grant for space-based red blood cell sorter development **\$60,000**

Other Recently Funded Projects

Kless Revolving Energy Loan Fund: "*Solar Car for Shell EcoMarathon*" 2012 **\$1,730**

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Perkins Foundation: "*Special Topics Course: Shell Eco-Marathon*" 2013 **\$5,500**

Kless Revolving Energy Loan Fund: "*Solar Car for Shell EcoMarathon*" 2012 **\$1,730**

The University of Montana "*Faculty Development Travel Grant for IEEE and ASME*" 2011 **\$1,500**

UMontana Research and Creativity Committee "*Human Powered Future ASME Grant*" 2011 **\$5,000**

Perkins Foundation "*Energy Auditing Technologies*" 2011 **\$2,500**

PATENTS AWARDED, SUBMITTED and PROVISIONAL PATENTS

"An Integrated Atomic Force Microscopy Nanomanipulation Platform" Bradley Layton and Gregory Buzby Issued January 19, 2010. Patent number 7,647,848.

"Electromechanical Roadway Energy Scavenging Device" (pending) Smith, Layton and Brown
Submitted February 16, 2013.

"A Surgical Stapler" Ari Brooks, Margaret Wheatley, Bradley Layton (pending)

"A Surgical Staple, with Elution Drug," Ari Brooks, Margaret Wheatley, Bradley Layton (pending)

"Vertical Axis Wind Turbine" Bradley Layton and Nicholas Haas, (submitted 2009)

"A Pontoon Rowing Boat" Bradley Layton (provisional patent, submitted November 29, 2005)

RECENT PUBLICATIONS last 3 years

Books

Layton, B.E. et al. "[Cell and Protein Mechanics](#)" B.E. Layton, Editor. Pan Stanford Publishing:
ISBN: 978-981-4316-83-5 (Hardcover); 978-981-4613-44-6 (eBook)

Layton, B.E. "[Zero Waste in the Last Best Place: A Personal Account and How-To Guide on Landfill-Free Living](#)" iUniverse 2017 (Editor's Choice, [Rising Star](#))

Layton, B.E. "Mechanoevolution" Bentham Science Publishers (invited, in preparation)

Book chapters

Layton, B.E. 2012. "The Role of MechanoEvolution in Predicting Future Technologies" in Systems Engineering for Micro and Nano Scale Technologies. Jonathan W. Plant, Janet L. Barth, M. Ann Garrison Darrin, Eds. Taylor & Francis / CRC Press Johns Hopkins Applied Physics Laboratory, Editor (invited)

Layton, B.E. and M. Brent Boyd. 2011. "Atomic Force Microscopy of Isolated Mitochondria" In: Atomic Force Microscopy: Methods and Protocols in Biomedical Applications, 736 pp. 133-151. P.C. Braga and D. Ricci, Eds. (invited) PMID: 21660726.

Recent Conference papers and abstracts published (5 of 75 total)

Layton, B.E. "Anthropogenic entropy acceleration and its relationship to Shannon information in the context of socioeconomics" Energy and Sustainability 2014, 16 – 18 December, Putrajaya, Malaysia

Layton, B.E. "Mechanoevolution: An Examination of the Coevolution of Humans and Technology" Inaugural meeting of the International Big History Association, August 5, 2012, Grand Rapids, MI

Marks, F.M., Layton, B.E., Lowman, A.M. 2012 "AFM Force Mapping Method for Quantifying Adhesion Energy of Poly Methacrylic Acid pH-sensitive Hydrogels In Vitro" 34th Annual IEEE-EMBS Annual Conference, San Diego, CA Aug 28 - Sep 1.

Layton, Bradley "Energy Technology Program at the University of Montana College of Technology" UM + MCPS: Transforming Public Education through Collaboration and Innovation May 9, 2012

Layton, Bradley, "The Application of Game Theory to Thermoconomics IMECE2011-62681" ASME International Congress and Exposition, November 11 – 17, 2011, Denver, Colorado.

CONSULTING AND EXPERT WITNESSING

Mechanical engineering and professional seal for carbon sequestration technology for breweries

Mechanical engineering consulting for major renewable energy and carbon sequestration parks

Mechanical engineering and permitting for off-grid webcam for kayak recreation area

Mechanical engineering consulting with NIST for CFL and power conditioner

Mechanical engineering consulting for sustainable forestry bioenergy extraction and low-emissions heat

Structural engineering for solar photovoltaic, solar thermal, and geothermal energy systems

Biomedical engineering consultation on viability of bone tissue engineering mechanical bioreactor

Biomedical engineering consultation for collagen-based tissue engineering construct

Biomedical engineering expert witness for knee prosthesis

Biomedical engineering expert witness for stair failure

Mechanical engineering consultation for the design of an improved aircraft arresting system

DESIGN/CONSTRUCTION PROJECTS

Off-grid mobile wind turbine as part of [Energy Practicum](#)

[Lighter-than-air wind turbine](#) as part of Energy Practicum

Solar cars for [Shell EcoMarathon](#)

Human-powered vehicles for [ASME Human Powered Vehicle Competition](#)

Nanomanipulation device to be used in atomic force microscope

Microfabricated device for measuring red blood cell mean volume

Educational atomic force microscope for use in high school classrooms

Surgical stapler and staple for anastomoses

PROFESSIONAL MEMBERSHIPS

American Society of Engineering Education • American Society of Mechanical Engineers • National Society of Professional Engineers • Biomedical Engineering Society • IEEE-EMBS Society (Editor) • International Big History Association • Order of the Engineer • World Society of Sustainable Energy Technologies

ATHLETIC ACCOMPLISHMENTS

United States Rowing Team *Single Sculler and Quadruple Sculls Rower*

1993 – 1997

[Queen Mother Cup](#) Champion 1995 & 1997

Qualifier for 1996 Olympic Games in Atlanta for the men's 4x