

Exponent®
Engineering & Scientific Consulting

Edward Myers, Ph.D., P.E., CRE

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Professional Profile

Dr. Myers is a physicist and electrical engineer with more than two decades of experience in electronic systems and technology. He has expertise in fields such as battery & power electronics, magnetic hard drives, nano/micromechanical systems (NEMS/MEMS), and chemical & biological sensor systems.

Dr. Myers has led problem-solving efforts involving consumer, medical, and industrial electronics, including failure analyses of mobile power circuits using lithium-ion batteries and independent risk & reliability assessments of client product designs.

Dr. Myers has experience with a range of scientific technologies and techniques, including the following: chemical identification and analysis using tools such as gas chromatographs (GC) and scanning electron microscopes (SEM), micro & nanofabrication of metallic and semiconductor electronics and sensors, and computer data analysis, modeling and simulation.

Prior to joining Exponent, Dr. Myers worked at Western Digital as a R&D scientist on advanced magnetic hard drive recording technologies. He has also worked at the California Institute of Technology as a senior scientist where he led a DARPA-funded effort to develop miniaturized gas analyzers using (NEMS) resonators, for real-time chemical warfare agent detection. For his Ph.D. work at Cornell University, Dr. Myers performed the first systematic study of nanoscale magnetic bit reversal by a spin-polarized current, which enables new kinds of high-speed and high-density computer memories.

Academic Credentials & Professional Honors

Ph.D., Physics, Cornell University, 2002

M.S., Physics, Cornell University, 1999

B.A., Physics, Oberlin College, 1996

Licenses and Certifications

Professional Engineer Electrical, California, #23534

ASQ Certified Reliability Engineer (CRE)

Certified Fire and Explosion Investigator (CFEI) (CA)

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Prior Experience

R&D Engineer, Western Digital, 2014-2016

Senior Scientist, California Institute of Technology, 2005-2014

Postdoctoral Scholar, California Institute of Technology, 2002-2005

Patents

US Patent 10,216,698: Analysis device including a MEMS and/or NEMS network, February 2019 (Ernst T, Andreucci P, Colinet E, Duraffourg L, Myers EB, Roukes ML).

US Patent 10,175,212: System and method for analyzing a gas, January 2019 (Andreucci P, Colinet E, Duraffourg L, Myers EB, Petitjean M, Roukes ML, Whiting J).

US Patent 9,588,084: Device for detecting gases and/or volatile organic compounds (VOC), March 2017 (Delapierre G, Hou-Broutin Y, McCaig H, Myers EB, Roukes ML).

US Patent 9,423,387: Localized deposition of polymer film on nanocantilever chemical vapor sensors by surface-initiated atom transfer radical polymerization, August 2016 (McCaig, H, Myers, EB, Roukes ML, Lewis, NS, Chi, D).

US Patent 9,291,600: Piezoresistive NEMS array network, March 2016 (Bargatin I, Aldridge JS, Myers EB, Roukes ML).

US Patent 9,016,125: NEMS comprising AlSi alloy based transducer, April 2015 (Andreucci P, Duraffourg L, Marcoux C, Brianceau P, Hentz S, Minoret S, Myers EB, Roukes ML).

US Patent 8,820,140: System for analyzing a gas mixture including at least one chromatography column, September 2014 (Puget P, Myers EB, Roukes ML)

US Patent 7,555,938: Thermoelastic self-actuation in piezoresistive resonators, July 2009 (Bargatin I, Arlett JL, Roukes ML, Kozinsky I, Aldridge JS, Myers EB).

US Patent 7,552,645: Detection of resonator motion using piezoresistive signal downmixing, June 2009 (Bargatin I, Myers EB, Li M, Arlett JL, Gudlewski B, Roukes ML, Young DK, Tang HX).

Publications

Whiting JJ, Myers EB, Manginell RP, Moorman MW, Anderson J, Fix CS, Washburn C, Staton A, Porter D, Graf D, Wheeler DR, Howell S, Richards J,, Monteith H, Achyuthan KE, Roukes ML, Simonson RJ. A high-speed, high-performance, microfabricated comprehensive two-dimensional gas chromatograph. Lab on a Chip 2019; doi: 10.1039/c9lc00027e.

McCaig HC, Myers EB, Lewis NS, Roukes ML. Vapor sensing characteristics of nanoelectromechanical chemical sensors functionalized using surface-initiated polymerization. Nano Letters 2014; 14:3728.

Zhang XC, Myers EB, Sader JE, Roukes ML. Nanomechanical torsional resonators for frequency-shift infrared thermal sensing. Nano Letters 2013; 13: 1528.

Arlett JL, Myers EB, Roukes ML. Comparative advantages of mechanical biosensors. Nature Nanotechnology 2011; 6: 203.

Myers EB, Li M, Tang HX, Aldridge JS, Roukes ML. Nanoelectromechanical resonator arrays for ultrafast

microscale chromatographic chemical analysis. Nano Letters 2010; 10: 3899.

Masmanidis SC, Tang HX, Myers EB, Li M, DeGreve K, Vemeulen G, Van Roy W, Roukes ML. Nanomechanical measurements of magnetostriction and magnetic anisotropy in GaMnAs. Physical Review Letters 2005; 95: 187206.

Bargatin I, Myers EB, Arlett J, Gudlewski B, Roukes ML. Sensitive detection of nanomechanical motion using piezoresistive signal downmixing. Applied Physics Letters 2005; 86: 133109.

Myers EB, Albert FJ, Sankey JC, Bonet E, Buhrman RA, Ralph DC. Thermally-activated magnetic reversal induced by a spin-polarized current. Physical Review Letters 2002.

Myers EB, Ralph DC, Katine JA, Albert FJ, Buhrman RA. Point-contact studies of current-controlled domain switching in magnetic multilayers. Journal of Applied Physics 2000.

Waintal X, Myers EB, Brouwer PW, Ralph DC. Role of spin-dependent interface scattering in generating current-induced torques in magnetic multilayers. Physical Review B 2000; 62: 12317.

Katine JA, Albert FJ, Buhrman RA, Myers EB, Ralph DC. Current-driven magnetization reversal and spin-wave excitations in Co/Cu/Co pillars. Physical Review Letters 2000; 84: 3149.

Myers EB, Ralph DC, Katine JA, Louie RN, Buhrman RA. Current-induced switching of domains in magnetic multilayer devices. Science 1999.

Project Experience

Performed reverse engineering analysis on hard drive data storage technology for a trade secrets dispute.

Performed Highly Accelerated Life Testing (HALT) on individual electronic components for a medical device company.

Managed a variety of electrical, thermal, and environmental tests as part of an ongoing analysis of products from a major smart home company.

Tested and analyzed failures of lithium ion cells for computer and electronics manufacturers.

Performed failure analysis of printed circuit boards that had experienced significant fire incidents in the field.

Executed statistical data analysis for a liability case involving a blood glucose monitor.

Performed inspections and failure analysis of marine electrical systems.

Peer Reviews

Journal of Failure Analysis and Prevention

Europhysical Journal

Nano Letters

Analytical Chemistry