# MICHAEL A. STICHTER, Ph.D., P.E.

PROFESSIONAL BIOGRAPHICAL OUTLINE

## BACKGROUND

Dr. Stichter is a licensed professional mechanical engineer with extensive experience in aviation, automotive, recreational, transportation, agricultural, commercial and industrial equipment and systems.

He has more than twenty-five years of experience in industrial manufacturing engineering; including gas turbine blades and vanes coatings, box trucks, hot aerospace structures, and gas generation equipment. His experience also includes design of manufacturing operations and specialized equipment such as machine guarding for personnel safety.

He has extensive experience inspecting and commissioning industrial gas generation systems at customer sites around the world (EMEA, Asia, Australia); including metals processing, glass manufacturing, and electrical power plants. He has engineered PEM Fuel Cell stacks and balance of plant, and related testing equipment; sensors, valves, pumps, humidification, phase separation, electrical load, and control systems.

## AREAS OF SPECIALTY

- Failure Investigation and Analysis of:
  - Mechanical Components
  - Electrical Components
  - Hydraulic Components
  - Engines
- Machine Guarding, Lock out/Tag out
- Industrial and Construction Safety
- Forensic Engineering
- Oxygen Safety
- Combustion chemistry detection, measurement, and controls
- Aviation
- Accident Investigation
- Mechanical Engineering
- Consumer Appliance Failure
- Battery Failure/Fire
- Codes and Standards
- Piping/Plumbing/HVAC
- Power Tools
- Laser Safety
- Hydrogen Safety
- Automobile Restoration

## LICENSES & CERTIFICATIONS

- Licensed Professional Engineer (PE)
  - Pennsylvania, PE # PE089115; Maryland, PE # 47945; Delaware # 22096; Massachusetts # 53988; New York # 099396; Colorado # PE.0054684, New Jersey # 24GE05471500, Texas # 134597, Alabama # 38527-E, California # M 42066, Connecticut # 37454, North Carolina # 57608, Nevada # 032765
- Certified Fire and Explosion Investigator (CFEI), NAFI# 22271-12997vi
- Certified Vehicle Fire Investigator (CVFI)
- Certified Fire Investigation Instructor (CFII)
- Diplomate in Forensic Engineering (DFE)
- Private Pilot, ASEL, FAA 4369186
- Remote Pilot, Small Unmanned Aircraft System, FAA 4043459
- Fork Lift Operation, Scissor Lift Operation, Aerial Lift Operation
- Bosch CDR Technician
- Certified Marine Investigator (CMI), #179 – IAMI #4304

## SUMMARY OF EXPERIENCE

Dr. Stichter's professional work experience includes:

- Electrochemistry including fuel cell and battery design and failure analysis.
- Jet engine manufacturing; Martian and lunar rover power plant development and manufacturing.
- Hydrogen and oxygen gas generation and plant engineering, construction, and failure analysis.
- Palletized gas generation systems, water purification, fire safety sensors and response systems.
- Gas compression, transfer, and storage equipment; piping and high pressure storage.
- PLC and HMI for control and monitoring of industrial operations.

Dr. Stichter has more than twenty-five years of experience in the design, manufacture, repair, and operation of passenger and high-performance motorcycles and racing cars from model years 1910 until today.

His interest in automobiles inspired him to start his post-secondary education at McPherson College, in McPherson, KS, where he earned an Associate of Technology degree in Automotive Restoration Technology. This program included concentrated lab work in mechanical, body/paint, wood working, and trim restoration. He applied this hands-on experience to further education by going on to study mechanical engineering at Drexel University. While pursuing his BSME degree, he gained experience in aviation and aerospace development and manufacturing.

After earning his BSME, he joined Teledyne Energy Systems where he continued working on development projects for aerospace $H_2/O_2$ PEM fuel cells and power systems. He developed systems for micro- and lunar-gravity passive reactant recirculation and water separation, and controls for the fuel cell system. He also engineered, commissioned, and repaired hydrogen (and oxygen) generation plants. These systems included the hydrogen generators (by electrolysis), compressors, storage tanks, deionized water, chillers, control systems, flame and gas detectors, and interconnecting piping.

Dr. Stichter's graduate research work focused on optical diagnostics of combustion chemistry and included performing ultraviolet (uv) laser induced fluorescence (LIF) experiments studying the OH radical in the afterglow of a nanosecond pulsed plasma discharge at temperatures below the auto-ignition threshold; cavity ringdown spectroscopy (CRDS), magneto-optic rotation (MOR), and cavity enhanced magneto-optic rotation (CEMOR) experiments studying OH concentrations in a lean methane-air slot burner; and development of a novel cw-CEMOR spectroscopy system to study small peroxy radicals in a flash photolysis facility using a narrow bandwidth continuous wave laser. This research is applicable to engineered products such as in flame detection and chemical concentration measurement for safety and process control.

Dr. Stichter received his Doctor of Philosophy, a Master of Science in Mechanical Engineering, and a BSME from Drexel University. Dr. Stichter is Assistant Professor of Engineering at McPherson College where he teaches and develops curriculum on the full breadth of Mechanical Engineering topics.

## FORMAL EDUCATION

- Doctor of Philosophy in Mechanical Engineering, Drexel University
- Master of Science in Mechanical Engineering, Drexel University
- Graduate Certificate in Engineering Management
- Bachelor of Science in Mechanical Engineering, Drexel University
- Associate of Technology, Automotive Restoration Technology, McPherson College

## PROFESSIONAL EXPERIENCE

### January 2017 – Present | ARCCA, LLC | Senior Mechanical Engineer

- Accident investigation and failure analysis of aviation and automobile components and systems; consumer, industrial, manufacturing and mining equipment
- Failure analysis of mechanical devices including industrial equipment such as fork lifts and scissor lifts
- Fire investigation of vehicles, structures, batteries, etc.
- Testing and development of player safety components for NHL
- Research in failure modes of lithium-ion batteries in consumer devices; i.e. vape devices

### January 2024 – May 2026 | ARCCA, LLC | Director of Failure Analysis/Engineering

- Managed and led team of engineers and materials scientists

### September 2006 – September 2010 | Teledyne Energy Systems | Hydrogen Systems Project Engineer

- Managed and engineered hydrogen generator systems projects; design, build and test
- Commissioned and engineered retrofits for field upgrades of hydrogen generation systems
- Designed and tested phase separation and fluid recirculation systems for micro/zero-g fuel cell systems
- Developed regenerative $H_2/O_2$ PEM fuel cell stack and balance of plant
- On-site investigation, repair, testing and support of fuel cell test stations
- Authored and edited Operations and Maintenance manuals for plant equipment
- Engineered controls for storage of Multi-mission Radioisotope Thermoelectric Generators (MMRTG)

### April – September 2005 | General Electric – Ceramic Composite Products | Project Engineer Intern

- Manufacturing engineering of carbon matrix/silicon carbide fiber parts for on-orbit plug and patch repair of wing leading edge and thermal protection tiles for Space Shuttle Orbiter, used on STS-114+

### September 2003 – March 2004 | Teledyne Energy Systems | Development Engineer Intern

- Designed and operated electrolysis separator material testing facility
- Operation and maintenance of PEM Fuel Cell life testing stations

### September 2002 – March 2003 | Pratt & Whitney – Advanced Coatings | Manufacturing Engineer Intern

- Engineering support of advanced coating technologies for thermal protection systems including ceramic and metallic coating of turbine blades and vanes

### June – September 2002 | Supreme Mid-Atlantic Corporation | Lean Manufacturing Coordinator

- Plant layout re-design for process efficiency gains through personnel safety
- Design and build machinery for truck body manufacturing
- Value Stream Mapping, 5S training

**September 2000 – February 2001 | John's Motor Service | Assistant Automotive Technician**

- Automotive and light truck service and repair, auto shop equipment maintenance

**May – August 2000 | Stony Bridge Landscaping | Landscaper**

- Commercial lawn maintenance and landscaping

## ACADEMIC EXPERIENCE

**Research Fellow: Combustion Chemistry & Optical Diagnostics, Drexel University, 2010 – 2016**
Dissertation Title: Cavity Enhanced Magneto-Optic Rotation for Measurement of $HO_2$

**May 2026 – Present | McPherson College | Founding Director and Chair of Engineering, Assistant Professor**

- Start and build Mechanical Engineering program with curriculum incorporating my engineering practice
- Teach and develop curriculum on the full breadth of Mechanical Engineering topics

## PROFESSIONAL SOCIETIES

- Society of Automotive Engineers (SAE)
- American Society of Mechanical Engineers (ASME)
- American Motorcycle Association (AMA)
- National Association of Fire Investigators (NAFI)
- American Society for Testing Materials (ASTM)
    - Committee G04 on Compatibility and Sensitivity of Materials in Oxygen Enriched Atmospheres
    - Committee E58 on Forensic Engineering
- Experimental Aircraft Association (EAA)
- International Society of Air Safety Investigators (ISASI)
- National Academy of Forensic Engineers (NAFE) – Senior Member
    - Director at Large
- National Association of Professional Accident Reconstruction Specialists (NAPARS)
- American Society for Engineering Education (ASEE)

## SPECIALIZED COURSEWORK

Motorcycle Safety Foundation (MSF) Basic Ridercourse, June 1999
Fire Hazards in Oxygen Systems, ASTM, April 2008
Combustion Energy Frontier Research Center, NSF, and Combustion Institute, June 2013
Vehicle Fire, Arson, and Explosion Investigation Science and Technology Seminar, NAFI, September 2017
Accessing and Interpreting Heavy Vehicle Event Data Recorders, SAE, May 2018
Aircraft Accident Investigation Course, USC, December 2024

## PUBLICATIONS AND PRESENTATIONS

**Stichter, Michael, and Lanning, W.;** "Forensic Deformation Analysis of a Farm Clevis Using Photographs and Exemplar Tests." Journal of the National Academy of Forensic Engineers 42, no. 1 (July 8, 2025).

**Stichter, M.; Ball, Z.; Jewell, C.; Lanning, W.;** "A Nondestructive Forensic Investigation of a Scissor Lift Fatality." Journal of the National Academy of Forensic Engineers 40, no. 1 (July 9, 2023).

**Stichter, M.**; "Why Lithium-Ion Batteries Fail, And What to Do About It," The 10th Annual Battery Safety Summit, Alexandria, Virginia, October 22-25, 2019. Chair of Battery Fires & Investigations session.

**Stichter, M.**; "Anatomy of Failure - Understanding the causes of lithium-ion battery fires," CLM Magazine, The CLM, August, 2017.

**Stichter, M.A.;** Cernansky, N.P.; Miller, D.L.; "Continuous Wave CEMOR for Measurement of $HO_2$," 10th US National Meeting of the Combustion Institute at the University of Maryland April 23-26, 2017.

**Stichter, M.A.**; Robbins, J.R.; Cernansky, N.P.; Miller, D.L.; "Continuous Wave Cavity Enhanced Magneto-Optic Rotation Spectroscopy for Small Combustion Radicals," Poster presented at 9th US National Meeting of the Combustion Institute at the University of Cincinnati May 17-20, 2015.

Wu, L.; Lane, J; **Stichter, M**; Cernansky, N; Miller, D; Fridman, A; "Effects of N2(v) and NO in Plasma-assisted Oxidation and Ignition Below Auto-ignition Threshold," AIAA 51st Aerospace Sciences Meeting, Grapevine, TX, January, 2013.

Lane, J.L.; **Stichter, M.A.**; Cernansky, N.P.; Miller, D.L.; "Development of a Sensitive and Selective Laser Diagnostic Technique for Measuring Paramagnetic Species," 8th US National Meeting of the Combustion Institute at the University of Utah May 19-22, 2013.

Lane, J.L; **Stichter, M.A.**; Cernansky, N.P.; Miller, D.L.; "A Flash Photolysis Facility for Fundamental $HO_2$ Studies," 8th US National Meeting of the Combustion Institute at the University of Utah May 19-22, 2013.

Lane, J.L.; **Stichter, M.A.**; Cernansky, N.P.; Miller, D.L.; "Selective Observation of the Anomalous Zeeman Effect Using Magneto Optic Rotation," Fall Technical Meeting of the Eastern States Section of the Combustion Institute at the University of Connecticut, October, 2011.

**Stichter, M.A.**; Ibrahim, S.; **"**Hydrogen Generation from Electrolysis," Teledyne Energy Systems, Inc. DOE/GO/13028-001, 2008.