Mark L. Norman, Ph.D.

Centerburst Consulting
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OVERVIEW

- Industry professional with over 20 years of experience in the application of analytical instrumentation to emergency response, homeland security, forensics, and industry
- Broad base of skills across various facets of technical business including training, applications, research, product development, product management, and marketing
- Seeking technical consulting opportunities in areas of training development, training delivery, and other aspects of field instrumentation requiring scientific expertise

TECHNICAL SKILLS

- Scenario-based Training
- Training Video Production
- Voiceovers and Audio Editing
- Fourier Transform Infrared (FT-IR)
- Raman Spectroscopy
- Ion Mobility Spectrometry (IMS)
- Quantum Cascade Lasers (QCL)
- High Pressure Mass Spectrometry (HPMS)
- Gas Chromatography-Mass Spectrometry (GC-MS)
- Infrared Spectral Interpretation
- Chemical Sensors
- Field-portable Instrumentation

INDUSTRY EXPERIENCE

Centerburst Consulting (2021 – present)
Position: Owner

- Develop and deliver scenario-based training curricula
- Produce training and marketing videos
- Provide scientific services such as new technology evaluation

908 Devices (2015 – 2021)
Positions: Director of Applications, Director of Technical Service, Director of Product Management, Customer Engagement Manager

- Produced numerous training videos for HPMS product line
- Produced *The MX Files* marketing videos highlighting customer field case studies
- Produced *The Instructor's Lounge* videos showcasing experience of contract trainers
- Co-hosted the *Hazard Class* podcast discussing topics relevant to emergency response
- Hosted numerous educational and promotional webinars
- Developed and delivered HPMS product training program based on blended learning
- Managed Applications Scientists, Technical Service Specialists, and contractors
- Implemented the Zendesk platform for tracking customer support tickets
- Evaluated and implemented Learning Management Systems (LMS) for online training

Block Engineering / MEMS (2013 – 2015)
Position: Director of Applications

- Managed technical sales support activities for commercial QCL and FTIR product lines
- Assessed customer samples and recommended product configurations for customer needs
- Wrote application notes, delivered conference presentations, and trained customers
- Designed and conducted experiments to evaluate prototype hardware and software

SensIR Technologies / Smiths Detection (2001 – 2013)
Positions: Applications Scientist, Applications Manager, Senior Scientist, Director of Applications & Training

- Managed technical sales support activities for chemical and biological detection business
- Developed scenario-based training curricula and managed customer training business
- Coordinated and delivered customer educational workshops
- Managed spectral interpretation component of 24/7 ReachBackID™ program
- Supervised Training Manager, Applications Specialists, contractors, and interns
- Led external collaborations for new applications development and instrument testing
- Evaluated prototype bioaerosol detection systems in laboratory and field experiments
- Coordinated production, delivery, and support of systems for extramural test programs
- Developed and executed test plans for characterizing prototype instrumentation

ACADEMIC EXPERIENCE

Bridgewater State University (2011 – 2013)
Position: Visiting Lecturer, Chemical Sciences

- Taught class and laboratory for Quantitative Chemical Analysis
- Taught recitation and laboratory for Introductory Chemistry sections
- Prepared recitation topics to reinforce concepts learned in lecture and lab
- Evaluated student performance and assign grades for notebooks and lab reports

FORMAL EDUCATION

Ph.D., Analytical Chemistry
University of North Carolina, Chapel Hill, NC (2001)

- Advisor: Dr. Roger E. Miller
- Collaborator: Dr. Douglas R. Worsnop, Aerodyne Research, Inc., Billerica, MA
- Dissertation: *Infrared Spectroscopic Investigations of the Complex Refractive Indices of Stratospheric Aerosols*
- Charles N. Reilley Graduate Student Fellowship

B.S., Chemistry
West Virginia Wesleyan College, Buckhannon, WV (1996)

- GPA 3.8 (4.0), *Magna cum Laude*
- Nicholas Hyma Chemistry Scholarship
- Outstanding Junior and Senior Chemistry Major Awards
- Phi Kappa Phi National Scholastic Honorary
- Alpha Psi Omega National Dramatic Arts Honorary

CONTINUED EDUCATION

Basic Laser Technology
SPIE Photonics West Conference Short Course, San Francisco, CA (2013)

Five Day MBA Workshop
American Management Association Short Course, Boston, MA (2010)

Analytical Organic Mass Spectrometry
Pittsburgh Conference Short Course, Orlando, FL (2010)

Project Management for Technical Professionals
American Chemical Society Conference Short Course, Boston, MA (2007)

Fundamentals of Ion Mobility (IMS) and Ion Mobility Mass Spectrometry (IMMS)
Pittsburgh Conference Short Course, Orlando, FL (2005)

Pharmaceutical Solids: Essential Knowledge and Advanced Concepts
SSCI, Inc. Short Course, Arlington, VA (May 2003)

Advanced Infrared Microspectroscopy
McCrone Research Institute Short Course, Westmont, IL (2002)

SELECTED CONFERENCE WORKSHOPS

Outclassing emerging threats with emerging technology

- International Association of Fire Chiefs, Baltimore, MD (2020 – 2021)
- HotZone, Houston, TX (2019)

Field identification of controlled substances: A toolbox approach

- International Association of Fire Chiefs, Baltimore, MD (2019 – 2021)
- HotZone, Houston, TX (2019)
- Midwest Hazardous Materials Response Conference, Northbrook, IL (2019)

Infrared and Raman chemical identification for emergency response

- Continuing Challenge, Sacramento, CA (2004 – 2009)
- International Hazardous Materials Response Teams, Hunt Valley, MD (2004 – 2009)
- Michigan State Emergency Management Summit, Acme, MI (2009)
- HazMat Explo, Las Vegas, NV (2008)
- VA Association of Hazardous Materials Response Specialists, Hampton, VA (2008)

Gas and vapor identification strategies for emergency response

- Continuing Challenge, Sacramento, CA (2008 – 2009)
- International Hazardous Materials Response Teams, Hunt Valley, MD (2008 – 2009)
- Michigan State Emergency Management Summit, Acme, MI (2009)
- Midwest Hazardous Materials Response Conference, Northbrook, IL (2009)
- VA Association of Hazardous Materials Response Specialists, Hampton, VA (2008)

Infrared and microspectroscopic techniques for forensics and industry

- Mid-Infrared Quantum Cascade Laser Systems, SciX Conference, Milwaukee, WI (2013)
- Bowdoin College FT-IR Course, Brunswick, ME (2002 – 2004)
- Eastern Analytical Symposium, Somerset, NJ (2002 – 2003)

INVITED LECTURES

"FT-IR on the Front Lines of Emergency Response," Society for Applied Spectroscopy New England Chapter meeting, Billerica, MA (2011)

"ATR and Other Sample Introduction Techniques for Infrared Spectroscopy, *or* ATR and 101 Other Uses for a KBr Pellet Press," Bridgewater State College Department of Chemistry, Bridgewater, MA (2007)

"FT-IR in Homeland Security," American Chemical Society Northeast Regional Meeting, Sacred Heart University, Fairfield, CT (2005)

"Suspicious White Powders: Applications of Infrared Microspectroscopy in Homeland Defense," New York Microscopical Society Meeting, John Jay College of Criminal Justice, New York, NY (2004)

SELECTED CONFERENCE PRESENTATIONS

"Rapid, Non-Contact Analysis of Surfaces and Chemical Materials used in the Pharmaceutical Industry," Making Pharmaceuticals Conference, Birmingham, England (2014)

"Qualities of External Cavity Quantum Cascade Lasers for Spectroscopy," Pittsburgh Conference, Philadelphia, PA (2013)

"Detection and Identification Solutions for CBRE Response," Counter Terror Expo, London, England (2010)

"Infrared Microspectroscopy as a Probe for Biological Agents within Solid Mixtures," Federation of Analytical Chemistry and Spectroscopy Societies (FACSS), Ft. Lauderdale, FL (2003)

"HazMatID: Portable FT-IR Technology for Hazardous Materials Identification," Japan's Exposition of Analytical Instruments and Solutions (JAIMA), Makuhari, Japan (2003)

"Anomalous Dispersion Effects in the Internal Reflection Analysis of Liquid Mixtures," Pittsburgh Conference, Orlando, FL (2003)

"Field-based Chemometric Quantitative Analysis of Polychlorinated Biphenyls in Oil Using Portable FT-IR Spectroscopy," Federation of Analytical Chemistry and Spectroscopy Societies (FACSS), Providence, RI (2002)

PUBLICATIONS

David W. Schiering, Robert B. Walton, Chris W. Brown, M. L. Norman, Joseph Brewer, and James Scott, "Towards the Characterization of Biological Toxins using Field-Based FT-IR Spectroscopic Instrumentation," *Proceedings of SPIE*, 5585, 21-32 (2004)

Mark L. Norman, Aaron M. Gagnon, John A. Reffner, David W. Schiering, and Jeffrey D. Allen, "An FT-IR Sensor for Identifying Chemical WMD and Hazardous Materials," *Proceedings of SPIE*, 5269, 143-149 (2004)

M. A. Jarzembski, M. L. Norman, K. Fuller, V. Srivastava, and D. R. Cutten, "Complex Refractive Index of Ammonium Nitrate in the 2-20 μm Spectral Range," *Applied Optics*, 42(6), 922-930 (2003)

M. L. Norman, R. E. Miller, and D. R. Worsnop, "Ternary $H_2SO_4/HNO_3/H_2O$ Optical Constants: New Measurements from Aerosol Spectroscopy under Stratospheric Conditions," *Journal of Physical Chemistry A*, 106, 6075-6083 (2002)

M. L. Norman, J. Qian, R. E. Miller, and D. R. Worsnop, "Infrared Complex Refractive Indices of Supercooled Liquid HNO_3/H_2O Aerosols," *Journal of Geophysical Research*, 104, 30571-30584 (1999)

Niedziela, R. F., M. L. Norman, C. L. DeForest, R. E. Miller, and D. R. Worsnop, "A Temperature- and Composition-Dependent Study of H_2SO_4 Aerosol Optical Constants Using Fourier Transform and Tunable Diode Laser Infrared Spectroscopy," *Journal of Physical Chemistry A*, 103, 8030-8040 (1999)

Niedziela, R. F., M. L. Norman, R. E. Miller, and D. R. Worsnop, "Temperature- and Composition-Dependent Infrared Optical Constants for Sulfuric Acid," *Geophysical Research Letters*, 25, 4477-4480 (1998)

PATENTS

"Gas Identification System," T. Sauer, G. Ressler, B. Burch, W. DeSousa, M. Frayer, K. Schreiber and M. L. Norman, U.S. Patent No. 7,253,413 (2007)

"Multi-detector Gas Identification System," M. L. Norman, T. Sauer, D. St. Pierre, G. Andersson, E. Diken, Patent No. 8,904,849 (2014)

REFERENCES AND VIDEO SAMPLES AVAILABLE ON REQUEST