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Michael Papageorge Ph.D., P.E., C.F.E.I

Dr. Papageorge is a licensed Professional Mechanical Engineer with experience investigating and consulting on failure and hazard analysis in a range of areas including complex electrical, chemical, and mechanical systems. He has investigated 100's of fires, explosions, and product failures in environments including residential and commercial structures, industrial complexes associated with chemical, petroleum, and pharmaceutical industries and grid-scale battery energy storage systems. His work has included ICE and battery electric vehicles (passenger, commercial, rail, and marine), yard equipment, home appliances and toys, construction equipment, and industrial accidents. The investigations addressed technical issues such as burn pattern interpretation, evaluation of ignition mechanisms, fire spread, smoke transport, fuel loading, and more.

Dr. Papageorge has published research on a variety of topics including the ignition of fuels in a heated environment and the propagation of flames in a vehicle fire. Dr. Papageorge's research has furthered our understanding of the complex chemical, fluid, and thermal steps that must occur for a fuel and oxidizer to mix, a heat source to lead to ignition, and spread of fire within structures and vehicles.

Education

Ph.D., M.S., Mechanical Engineering, Ohio State University

B.S.E, Mechanical Engineering and Aerospace Engineering, Princeton University

Professional Registrations and Certifications

Registered Professional Mechanical Engineer, Arizona #70208

Certified Fire & Explosion Investigator - NAFI

Professional/Academic Memberships and Honors

SAE World Congress, Fire Safety – Chair (2024 – Present), Vice Chair (2022-2024)

ASTM Committee E58 on Forensic Engineering – Chair of Vehicles Subcommittee

NFPA 1192 Standard on Recreational Vehicles – Member (2021-2024)

Ohio State University Graduate School Presidential Fellowship

Morgan W. McKinzie '93 Senior Thesis Fund Award (Princeton University)

Publications

Papageorge, M. and Colwell, J., (2024). Evaluating Fire Propagation into the Passenger Compartment via Full-Scale Burn Testing. SAE Technical Paper 2024-01-2502.

Papageorge, M., Knox, B., Colwell, J., (2024). Full-Scale Vehicle Burn Test of a 2013 Sedan in a Wildfire Setting. SAE Technical Paper 2024-01-2503.

Williams, O.J.H., Sahoo, D., Papageorge, M., Smits, A.J., (2021). Effects of roughness on a turbulent boundary layer in hypersonic flow. *Exp. in Fluids*, 62:9

Knox, B.W., Papageorge, M., Colwell, J.D. (2020). Full-Scale Burn Test of a 2014 Sport Utility Vehicle. SAE Technical Paper 2020-01-0925.

Arndt, C.M., Papageorge, M., Fuest, F., Sutton, J.A., Meier, W. (2019) Experimental investigation of the auto-ignition of a transient propane Jet-in-Hot-Coflow. *Proc. Combust. Inst.*, (2019) 37:2117-2124

Papageorge, M. and Colwell, J. (2018) High-Performance Rear- and Mid-Engine Vehicle Exhaust System Temperatures. SAE Paper 2018-01-1436.

Papageorge, M. and Sutton, J.A. (2017) Intrusive effects of repetitive laser pulsing in high-speed tracer-LIF measurements. *Exp. In Fluids*, 58:40.

Papageorge, M. (2017) A study of scalar mixing in gas phase turbulent jets using high repetition rate imaging. Ph. D. Dissertation, Ohio State University.

Papageorge, M. and Sutton, J.A. (2016) Statistical processing and convergence of finite-record-length time-series measurements from turbulent flows. *Exp. in Fluids*, 57:126.

Arndt, C.M., Papageorge, M., Fuest F., Sutton, J.A., Meier, W., Aigner, M., (2016) The role of temperature, mixture fraction, and scalar dissipation rate on transient methane injection and auto-ignition in a jet in hot coflow burner. *Combust. Flame*, 167:60-71.

McManus, T., Papageorge, M., Fuest, F., Sutton, J. (2015) Spatio-temporal characteristics of temperature in turbulent non-premixed jet flames. *Proc. Combust. Inst.*, (2015), 35:1191-1198.

Papageorge, M., McManus, T., Fuest, F., Sutton, J. (2014) Recent advances in high-speed planar Rayleigh scattering in turbulent jets and flames: increased record lengths, acquisition rates, and image quality. *Appl. Phys. B*, (2014) 115:198-213.

Papageorge, M., Arndt, C., Fuest, F., Meier, W., Sutton, J. (2014) High-speed mixture fraction and temperature imaging of pulsed, turbulent fuel jets auto-igniting in high-temperature, vitiated co-flows. *Exp. in Fluids*, 55:1763.

Fuest, F., Papageorge, M., Lempert, W.R., Sutton, J.A. (2012) Ultrahigh laser pulse energy and power generation at 10 kHz. *Opt Lett.*, 37:3231-3233.

Invited Presentations

Papageorge, M. (2015) Recent advances in laser diagnostics applied to reacting and non-reacting turbulent flows. Presented at Clean Combustion Group, University of Sydney, Sydney, NSW, Australia.

Presentations and Published Abstracts

Papageorge, M. and Sutton, J. (2015) Space-time correlations in a turbulent gas-phase jet. 68th APS Div. of Fluid Dynamics Meeting, Boston, MA, Nov., 2015.

Papageorge, M. and Sutton, J. (2015) Simultaneous high-resolution kHz-rate 2-D conserved scalar and 3-component velocity field measurements in gas-phase turbulent jets. 53rd AIAA Aerospace Sciences Meeting, Kissimmee, FL, Jan., 2015.

Papageorge, M. and Sutton, J. (2014) Simultaneous high-resolution kHz-Rate 2-D conserved scalar and 3-component velocity field measurements in gas-phase turbulent jets. 17th Lisbon Symposium on Laser Diagnostics, Lisbon, Portugal, July, 2014.

Papageorge, M., Fuest, F., Sutton, J. (2014) Dynamics of conserved scalar mixing and transport in gas-phase turbulent jets. 52nd AIAA Aerospace Sciences Meeting, National Harbor, MD. Jan., 2014.

McManus, T., Papageorge, M., Fuest, F., Sutton, J. (2014) Turbulent non-premixed jet flames using high-speed planar Rayleigh scattering. 52nd AIAA Aerospace Sciences Meeting, National Harbor, MD. Jan., 2014.

Papageorge, M., Fuest F., Sutton, J. (2013) Statistical and visual analysis of conserved scalar mixing dynamics in turbulent jets using kHz-rate imaging. 66th APS Div. of Fluid Dynamics Meeting, Pittsburgh, PA, Nov., 2013.

Papageorge, M., Fuest, F., Sutton, J. (2013) Spatio-temporal characteristics of scalar mixing in turbulent gas-phase jets. 51st AIAA Aerospace Sciences Meeting, Grapevine, TX, Jan., 2013.

Fuest, F., Papageorge, M., Lempert, W., Sutton, J. (2013) Development of a high-energy pulse burst laser system for high-speed fluid dynamics and combustion measurements. 51st AIAA Aerospace Sciences Meeting, Grapevine, TX, Jan., 2013.

Papageorge, M. and Sutton, J. (2012) Time-resolved, two-dimensional imaging of scalar mixing in turbulent gas-phase jets. 65th APS Div. of Fluid Dynamics Meeting, San Diego, CA, Nov., 2012.

Papageorge, M., Lempert, W., Sutton, J. (2012) Development of a next-generation pulse burst laser system for time-resolved fluid dynamics and combustion measurements. 50th AIAA Aerospace Sciences Meeting, Nashville, TN, Jan., 2012.

Sahoo, D., Papageorge, M., Smits, A. (2010) PIV Experiments on a rough wall hypersonic turbulent boundary layer. 40th AIAA Fluid Dynamics Conference, Chicago, IL, Jun. 2010.

Sahoo, D., Papageorge, M., Smits, A. (2008) PIV measurements of turbulence in a hypersonic boundary layer. 61st APS Div. of Fluid Mechanics Meeting, San Antonio, TX, Nov., 2008.