Professor Ömer L. Gülder – Curriculum Vitae

J. Armand Bombardier Foundation Chair: University of Toronto -
Institute for Aerospace Studies

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Contents

1 Appointment

Rank:	Professor
Appointment date:	November 2001
	Tenured; Full time

2 Contact Information

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3 Education

B.Sc.	Mechanical Engineering	Middle East Technical University, Türkiye	1971
M.Sc.	Mechanical Engineering	Middle East Technical University, Türkiye	1974
Ph.D.	Mechanical Engineering	University of Manchester, England	1977

4 Current Research Interests

(Research Field: Combustion and Propulsion)

- Turbulent Combustion	Spray combustion in aviation gas turbines; Premixed turbulent flame propagation; Soot formation in non-premixed flames
- Sustainable Aviation Fuels	Fit-for-purpose drop in fuels; Hydrogen and biofuels
- Soot Aerosol Formation	Soot formation at high pressures; Gas turbine spray combustion
- Thermal Stability of Aviation Jet Fuels	Conventional and sustainable jet fuels
- Optical Combustion Diagnostics	Laser-induced incandescence for soot; Spectral soot emission; Soot aggregate morphology
- Aviation's Impact on Climate Change	Soot aerosol and contrail formation

5 Professional Employment Record

1971 – 1974	Power plant engineer	Turkish Electricity Authority
1974 – 1977	Graduate research assistant	University of Manchester, UK Simon Engineering Labs
1977 – 1981	Assistant professor	Mechanical Engineering Department Middle East Technical University, Turkey
1981 – 1989	Associate Research Officer	National Research Council Canada
1989 – 2001	Group Leader / Section Head	National Research Council Canada Combustion Research Labs
2001 – present	Professor	UTIAS – University of Toronto
(2007 – 2016)	(Associate Director)	UTIAS – University of Toronto

6 Academic and Professional Honours and Distinctions

- J. Armand Bombardier Foundation Chair Professor, 2022
- Fellow of the Combustion Institute, 2018
- Fellow Canadian Academy of Engineering, 2012
- Associate Fellow, American Institute of Aeronautics and Astronautics, 2011
- NRC Outstanding Achievement Award in support of NRC research objectives, 1996
- NRC Staff Performance Award, 1993
- NRC Research Associateship, 1981-1984
- Research Assistantship, Univ. of Manchester, 1976-1977
- Ph.D. Scholarship, British Council and Ministry of Education, 1974-1977
- Undergraduate Scholarship, Ministry of Education, 1967-1971

7 Professional Interests and Expertise

7.1 Teaching: 1977 – 1981; 1986 – 1989; 2001 – 2025

Taught a variety of courses in the thermal sciences area, both at the undergraduate and graduate levels including Combustion, Gas Turbines & Propulsion, Gas Dynamics, Combustion Engines, Thermodynamics, and Mechanical Engineering Laboratory. Developed three new courses on Combustion and Reactive Flows, one for 3rd year undergraduate Aerospace students, and the other two for graduate students at UTIAS.

AER 515 (AER 315 before 2023) Combustion Processes (2004W; 2005W; 2006W; 2007W; 2007F; 2008F; 2009F; 2010F; 2011F; 2012F; 2013F; 2015F; 2016F; 2017F; 2018F; 2019F; 2021F, 2023F, 2024F)

AER 510 Aerospace Propulsion (2008W; 2009W)

AER 1304 Fundamentals of Combustion (2002F; 2003F; 2004F; 2005F; 2006F; 2007F; 2008F; 2009F; 2010F; 2011F; 2012F; 2013F; 2014F; 2015F; 2016F; 2017F; 2018F; 2019F; 2021F; 2022F, 2023F, 2024F)

AER 1306 Special Topics in Reactive Flows (2005W; 2006W; 2007W; 2008W; 2009W; 2010W; 2011W, 2012W; 2013W; 2014W; 2015W; 2016W; 2017W; 2018W; 2019W; 2020W; 2021W; 2022W; 2023W, 2024W)

7.2 Research and Scholarship – Major forefront research accomplishments

Gas Turbine Combustion: Influence of fuel chemistry and flame temperature on soot formation in combustors; sooting propensities of aviation turbine fuels; turbulent combustion and radiation in gas turbine combustors; thermal oxidative stability of aviation fuels; coking avoidance.

Soot Formation: Influence of pressure, gravity, fuel chemistry, flame temperature, N_2, SO_2, CO_2, O_2, and H_2 dilution on soot formation in diffusion flames.

Turbulent Premixed Combustion: Flame propagation regimes, structure of turbulent premixed flame fronts, application of stochastic techniques to flame propagation, flame front interrogation by optical/spectroscopic techniques.

Laminar Premixed Combustion: Hydrogen enrichment; Lean-premixed combustion; NOx formation in lean-premixed and hydrogen-enriched combustion; Burning velocities of methanol, ethanol, and gasoline at elevated pressures and temperatures; Burning velocities of gasoline - methanol, methanol-water, and ethanol-water blends.

Transient Dense Sprays: Structure and drop size distribution of diesel sprays; influence of injection pressure profile on temporal drop size; temporally and spatially resolved drop size distribution in intermittent sprays.

Laser-based Combustion Diagnostics: Development and application of laser induced incandescence (LII) as a diagnostic for soot particulate measurements; soot concentration and size measurements by multi-wavelength extinction; size measurement by diffraction in dense sprays; engineering approaches to correct bias due to multiple scattering in dense sprays; turbulent flame front imaging by laser induced OH fluorescence (OH LIF) and Mie scattering.

Sustainable Transportation Fuels: Performance and exhaust emission characteristics of biomass derived aviation and ground transportation fuels; hydrogen as a potential transportation fuel.

Fuel Technology: Influence of fuel chemical structure on aviation and diesel fuel ignition quality; development of fast and accurate non-engine ignition quality prediction techniques based on NMR spectroscopy; thermal stability and coking propensity of aviation fuels.

7.3 Innovation and Technology Transfer

My research work within the last 25 years on soot and particulate formation in combustion had led to creation of a team who have conceived and developed "Field LII", an instrument for real-time optical measurement of nano-size carbon particles using laser-induced incandescence. The developed technology had led to three patents (one world-wide, second in US, Canada, and Japan, and third one in US and Canada), patents P.1 to P.3. We licensed the LII technology for commercialization and a commercial instrument is now available for monitoring particulate matter (PM) in various types of engine exhausts and in the atmosphere. Instrument is also used widely in soot research.

7.4 Patents

[P.1] Snelling, D. R., Smallwood, G. J., Liu, F., and Gülder, Ö. L., "Small Particle Analysis by Laser Induced Incandescence", Patent No. US 6,809,820 B2, October 26, 2004; Canada CA2380735.

[P.2] Snelling, D. R., Smallwood, G. J., and Gülder, Ö. L., "Method and Apparatus for Applying Laser Induced Incandescence for the Determination of Particulate Measurements", Patent No. US 6,181,419 B1, Jan. 30, 2001; Canada CA2,272,758; Japan JP200055800-A.

[P.3] Snelling, D. R., Smallwood, G. J., and Gülder, Ö. L., "Absolute Light Intensity Measurements in Laser Induced Incandescence", Patent No. US 6,154,277, Nov. 28, 2000; Canada, 2,272,255; EPO and Japan, EP0959329 A3.

8 Supervision

8.1 Postdoctoral Fellows, Research Associates and Engineers (at the University of Toronto)

Start	Completion	Name	Research Area
2004	2006	Dr. David Pavé	Laser diagnostics of combustion; turbulent premixed flame structure
2005	2006	Dr. Guillaume Dayma	Chemical kinetic simulation of combustion
2007	2008	Dr. S. Tebajaamat	Combustion modelling
2008	2010	Dr. Mario Commodo	Thermal oxidative stability of aviation jet fuels
2011	2017	Dr. Frank Yuen	Altitude emissions control for aviation; aviation jet fuel thermal stability
2015	2017	Dr. Peter Joo	Soot formation at high pressures

2015	2017	Dr. Sina Kheirkhah	Turbulent premixed combustion
2017	2018	Dr. Moah Christensen	High pressure soot formation in biofuel flames
2017	2019	Dr. Emre Karatas	Soot morphology at high pressure combustion
2020	2021	Taylor Rault	Gas turbine spray combustion
2021	current	Leo Nataj	High pressure combustion facility operational and research engineer
2024	current	Dr. Sajjad Mohammadnejad Daryani	Turbulent combustion

8.2 Postdoctoral Fellows (at the National Research Council Canada)

Start	Completion	Name	Research Area
1987	1988	Dr. J. J. Liu	Spray diagnostics by laser diffraction
1990	1991	Dr. S. M. Aval	Structure of dense sprays
1991	1992	Dr. B. Deschamps	Turbulent premixed combustion
1992	1993	Dr. J.-C. Sautet	Turbulent premixed combustion
1994	1998	Dr. X. Li	Effect of fuel properties on engine emissions
1996	1997	Dr. A. Tanjo	Two-colour PIV image analysis

8.3 PhD Supervision (at the University of Toronto)

Start	Completion	Candidate's Name	Thesis Title
2000	2005	Kevin Thomson	Soot formation in annular non-premixed laminar flames of methane-air at pressures of 0.1 to 4.0 MPa (co-supervisor EJ Weckman, Waterloo)
2003	2009	Frank Yuen (MASc and PhD)	Experimental investigation of the dynamics and structure of lean premixed turbulent combustion
2003	2011	F. Hernandez Perez (MASc and PhD)	Subfilter scale modelling for large eddy simulation of lean hydrogen-enriched turbulent premixed combustion (co-supervisor CPT Groth)
2003	2010	Wen Lin (MASc and PhD)	Large eddy simulation of premixed turbulent combustion using flame surface density approach. (co-supervisor CPT Groth)
2005	2010	Peter H. Joo	Soot formation in non-premixed laminar flames at subcritical and supercritical pressures.

2006	2010	March Charest	Numerical modelling of sooting laminar diffusion flames at elevated pressures and microgravity (co-supervisor CPT Groth)
2009	2015	Nasim Shahbazian	Subfilter scale combustion modelling for large eddy simulation of turbulent premixed flames (co-supervisor CPT Groth)
2010	2014	A. Emre Karataş	High-pressure soot formation and diffusion flame extinction characteristics of gaseous and liquid fuels
2011	2015	Sina Kheirkhah	Experimental study of turbulent premixed combustion in V-shaped flames
2011	2016	Parsa Tamadonfar	Experimental investigation of premixed turbulent hydrocarbon/air Bunsen flames
2012	2018	Sandipan Chatterjee	Turbulent non-premixed swirl-stabilized flames of gaseous and liquid fuels in a gas turbine model combustor
2014	2019	Yu-Lin Wang	Flow field and soot formation characteristics in swirl-stabilized non-premixed turbulent flames
2017	2023	Rahul Vishwanath	Investigations on soot and flow field characteristics of blended liquid and gaseous fuels in turbulent swirl-stabilized non-premixed flames
2018	in progress	Rayne Sung	Aviation jet fuel thermal stability
2018	in progress	Rajat Sawanni	Soot formation at elevated pressures
2019	in progress	Praful Kumar	Turbulent premixed combustion
2021	in progress	Yash Rajan	Soot aerosol morphology (co-supervisor A. E. Karataş, Toronto Metropolitan)
2021	in progress	Ritesh Maurya	Aviation gas turbine combustion
2021	in progress	Amirhossein Azimi	Gas turbine spray combustion
2022	in progress	Abdalrazik Ali	Premixed turbulent combustion (co-supervisor M. Talei, Melbourne)
2022	in progress	Daniel Cormier	Soot diagnostics (co-supervisor A. E. Karataş, Toronto Metropolitan)
2023	in progress	Mohammad Razavi	Pyrolysis and soot formation of aviation fuels at high-pressures

8.4 PhD Supervision (at the National Research Council Canada)

Start	Completion	Candidate's Name	Thesis Title
1988	1992	Asli Işiğigur	Safflower Seed Oil as an Alternative Diesel Fuel (co-supervisor F. Hamdullahpur, TUNS / Dalhousie Universty)

8.5 MASc Supervision (at the University of Toronto)

Start	Completion	Candidate's Name	Thesis Title
2002	2005	Décio Bento	Soot formation in propane-air laminar diffusion flames at elevated pressures
2003	2006	Paul Mandatori	Soot formation in ethane-air coflow laminar diffusion flames at elevated pressures
2003	2005	Esen Cintosun	Analysis of premixed turbulent flame front images obtained by Mie scattering and laser-induced fluorescence of OH
2003	2006	Fréderic Dandavino	Development of a two-line atomic fluorescence technique for temperature measurement in diffusion flames
2004	2006	Kathleen Bohan	Soot formation in laminar diffusion flames of gas mixtures
2004	2006	Natalie Galley	Investigation of thermal flame structure in lean turbulent premixed methane-air flames by Rayleigh scattering
2004	2006	Marie Vaillancourt	High pressure soot formation in non-smoking methane-air laminar diffusion flames from 1.5 to 6.0 MPa
2004	2006	Srivatsava Puranam	Flame surface density of turbulent premixed flames at medium to high turbulence intensities
2006	2010	Trevor Kempthorne	Laser-induced incandescence technique for soot diagnostics in combustion
2007	2009	Natalie Panek	An investigation of ethylene laminar diffusion flames at sub-atmospheric pressures to simulate microgravity
2007	2010	Owen Wong	Design and development of an apparatus to study aviation jet fuel thermal stability
2007	2009	Emre Karatas	Soot formation in coflow and counterflow laminar diffusion flames of fuel mixtures
2009	2011	Gorngrit Intasopa	Soot measurements in high-pressure diffusion flames of gaseous and liquid fuels
2009	2012	Arup Barua	Soot formation in diffusion flames of alternative turbine fuels at elevated pressures
2009	2011	Daniel Cormier	Laser-induced incandescence for high pressure combustion diagnostics
2009	Withdrawn	Ivo Fabris	Thermal oxidative stability of jet fuels
2009	2010	Sintia Bejatovic	Discrete Explicit Filtering Techniques for LES with AMR (co-supervisor CPT Groth)
2010	2013	Timothy Kwon	Extinction limits of laminar diffusion counterflow flames of various gaseous fuels including syngas and biogas

2010	2012	Sanaz Ghasemi	Laser-induced incandescence at high pressures
2010	2013	Ali Nasseri	Development of surrogates for aviation jet fuels
2011	2013	Jason Liang	Design and development of an experimental apparatus to study jet fuel coking in small gas turbine fuel nozzles
2011	2014	Zhao Liu	Modelling of thermal oxidative stability of jet fuels
2012	2014	Christopher Halmo	Study of turbulent swirl-stabilized non-premixed ethylene flames in a model combustor
2012	2014	Weichao Wang	Experimental and numerical investigation of structure and extinction limits of biofuels in laminar counterflow diffusion flames (co-supervisor CPT Groth)
2012	2015	Adam O'Brien	Numerical simulation of thermoacoustic response of laboratory scale premixed multi-slit burner flames (co-supervisor CPT Groth)
2013	2015	Adriana Daca	Soot Formation at High Pressures in Laminar Liquid and Gaseous Fuel Flames
2013	2016	Alex Vargas	Design and development of a thermophoretic soot sampling system for high pressure laminar diffusion flames
2015	2017	Neell Young	An analysis of thermal stability of conventional and alternative aviation fuels
2016	2019	Cody Bauer	Spray characterization of an aircraft gas turbine engine hybrid fuel nozzle
2016	2018	Ben Gigone	Effect of pressure on soot morphology in laminar diffusion flames
2016	2018	Elizabeth Griffin	The sooting propensities of ethanol, ethylene, propylene, and butylene at elevated pressures
2017	2019	Sara Khan	A parametric study of jet fuel thermal stability
2017	In progress	Ral Bielawski	Premixed turbulent combustion simulation
2018	2020	Silin Wang	Effects of fuel doping and fuel chemistry on soot formation in co-flow laminar diffusion flames at elevated pressures
2018	2020	Taylor Rault	Soot, flow field, and spray structure in turbulent swirl-stabilized spray flames of Jet A-1/biofuel blends in a model gas turbine combustor
2019	2021	Peter Carniglia	Effects of flow field and spray characteristics on soot in a swirl-stabilized model combustor
2019	Withdrawn	Dominic Mortimer	Multi-angle scattering soot diagnostics
2020	2022	Jacob Weber	Soot and flow field in turbulent swirl-stabilized spray flames of Jet A-1 withdownstream air

			injection in a model gas turbine combustor
2021	2023	Mohammad Razavi	A micro flow reactor for studying pollutant formation

8.6 MASc Supervision (at the Middle East Technical University)

Start	Completion	Candidate's Name	Thesis Title
1978	1980	Tuğrul Uşşakli	Performance of a Multi-cylinder Passenger Car Engine Fuelled with Ethanol and Gasoline
1979	1981	Arif H. Tanribilir	Performance of a Spark Ignition Engine Fuelled with Ethanol-Water Blends at High Compression Ratios
1979	1981	M. Merih Özgen	Development of an Algorithm to Determine the Equilibrium Temperature and Composition of Constant Volume or Constant Pressure Combustion of a C-H-O-N-Ar System
1979	1981	Serdar Nişli	Development of a Digital Computer Program for the Simulation of the Power Cycle and Pollutant Formation in Spark Ignition Engines (co-supervisor A. D. Bayka)
1980	1983	M. Riza Arat	Mathematical Modelling of Rotary Dryers (co-supervisor B. Platin)

8.7 MEng Supervision (4 month term project in lieu of a course)

Start	Completion	Candidate's Name	Thesis Title
2013	2013	Pooja Sharma	JetA1 unstressed and stressed fuel analysis by NMR, IR and MS
2020	2020	Aysegul Arslan	Analysis of battery system for an all-electric aircraft
2020	2020	Zhe Li	Review of the state-of-the-art for micro-turbine
2021	2021	Nishant Thillai	In-depth analysis/comment on the paper "Experimental study of the combustion and emission characteristics of ethanol, diesel-gasoline, n-heptane-iso-octane, n-heptane-ethanol anddecane-ethanol in a constant volume vessel"
2021	2021	Lakshmanan Velappan	Critical Assessment of an Experimental Study of Combustion and Emission Characteristics of Lower Alcohols in Constant Volume Vessel
2022	2022	Vanessa Lai	Hydrogen as an aviation fuel

8.8 BASc Undergraduate Thesis Supervision

Start	Completion	Candidate's Name	Thesis Title
2005	2005	Eugene Zassoko	Design of a surrogate jet fuel
2006	2006	Owen Wong	Soot formation rates at high pressures
2008	2008	Alex Lin	High pressure soot formation
2009	2009	Quinn Jien	Effect of fuel structure on ignition quality and sooting tendency of jet fuels
2009	2009	Graham Feltham	Laminar burning velocities of transportation fuels
2010	2011	George Panagiotoglou	Structure of turbulent premixed flames
2010	2011	Kevin Pui	Ignition quality and sooting propensity of aviation fuels
2012	2012	Weiqing Fang	Properties of alternative aviation fuels
2012	2013	Navid Nourian	Extinction of diffusion flames of alcohols
2014	2015	Neell Young	Properties of aviation fuels
2017	2018	Zijun Xu	Sooting propensities of hydrocarbons
2018	2019	Mohamed Widaatalla	Sooting propensities of aviation fuels
2019	2020	Jacob Weber	Micro-channel combustion
2020	2021	Mohammad Razavi	Micro-channel reactor design
2023	2024	Pauline Wang	Sustainable aviation fuels

9 Publications

9.1 Identifiers for Bibliometric Data

- Web of Science Researcher ID: E-3256-2013
- Scopus ID: 7006436196
- ORCID: 0000-0001-5342-9837
- Google Scholar

9.2 Journal manuscripts submitted / under review

[S.1] Sung, R., Young, N.G., Razavi, M.R., Canteenwalla, P., Chishty, W., and Gülder, Ö. L. Thermal stability and coking propensity assessment of alternative aviation turbine fuels using a novel experimental methodology, *Under review*.

9.3 Refereed Journal Publications

[J.1] R. Sawanni and Gülder, Ö. L. A tractable methodology for assessing the pressure scaling of sooting processes in a counterflow diffusion flame at 1 to 6 bar, *Proceedings of the Combustion Institute*, Vol. 40, 105745, 2024. doi:10.1016/j.proci.2024.105745

[J.2] R. B. Vishwanath, P. Carniglia, J. Weber, and Gülder, Ö. L. Effects of *n*-pentanol blending on soot formation in swirl-stabilized turbulent spray flames of Jet A-1 in a laboratory gas turbine combustor, *Fuel*, Vol.357, 129971, 2024. doi:10.1016/j.fuel.2023.129971

[J.3] Vishwanath, R.B. and Gülder, Ö. L. Hydrogen enrichment enhances soot formation in swirl-stabilized non-premixed turbulent combustion of ethylene in a model gas turbine combustor, *Proceedings of the Combustion Institute*, Vol.39, pp.889-898, 2023. doi:10.1016/j.proci.2022.07.160

[J.4] Yang, S.S. and Gülder, Ö. L. Impact of *n*-butanol substitution in ethylene on soot yields in laminar diffusion flames at pressures 3 to 10 bar, *Combustion and Flame*, Vol. 245. 112236, 2022. doi:10.1016/j.combustflame.2022.112326

[J.5] Kheirkhah, S. and Gülder, Ö. L. A revisit to the validity of flamelet assumptions in turbulent premixed combustion and implications for future research, *Combustion and Flame*, Vol. 239, 111635, 2022. doi:10.1016/j.combustflame.2021.111635

[J.6] Gülder, Ö. L. Does soot form in a spark-ignition engine fuelled with lean methanol and methanol-hydrogen mixtures?, *Fuel*, Vol. 306, 121728, 2021. doi:10.1016/j.fuel.2021.121728

[J.7] Thillai, N., Gülder, Ö. L. Critique of the experimental study of the combustion and emission characteristics of ethanol, diesel-gasoline, n-heptane-iso-octane, n-heptane-ethanol and decane-ethanol in a constant volume vessel, *Fuel*, Vol. 304, 121368, 2021. doi:10.1016/j.fuel.2021.121368

[J.8] Mortimer, D. and Gülder, Ö. L. Comments on effects of adding cyclohexane, n-hexane, ethanol, and 2,5-dimethylfuran to fuel on soot formation in laminar coflow n-heptane/iso-octane diffusion flame, *Combustion and Flame*, Vol. 232, 111555, 2021. doi:10.1016/j.combustflame.2021.111555

[J.9] Weber, J. K., Razavi, M. R., Carniglia, P., and Gülder, Ö. L. Comments on the Experimental Study of the Combustion and Emission Characteristics of Lower Alcohols in a Constant Volume Vessel, *Energy and Fuels*, Vol. 35(15), pp. 12753-12757, 2021. doi:10.1021/acs.energyfuels.1c01233

[J.10] Yang, S. S. and Gülder, Ö. L. Sooting propensity dependence on pressure of ethylbenzene, p-xylene, o-xylene and n-octane in laminar diffusion flames, *Combustion and*

Flame, Vol. 227, pp. 202-213, 2021.
doi:10.1016/j.combustflame.2021.01.008

[J.11] Yang, S. S. and Gülder, Ö. L. Ethanol supplement increases soot yields in nitrogen-diluted laminar ethylene diffusion flames at pressures from 3 to 5 bar, *Combustion and Flame*, Vol. 227, pp. 1-10, 2021.
doi:10.1016/j.combustflame.2020.12.039

[J.12] Yang, S. S. and Gülder, Ö. L. Sooting characteristics of ethanol-ethylene blends in laminar coflow diffusion flames up to 10 bar, *Combustion and Flame*, Vol. 225, pp. 39-47, 2021.
doi:10.1016/j.combustflame.2020.10.032

[J.13] Rault M. T., Vishwanath, B. R., Gülder, Ö. L. Spray characteristics, velocity field, and soot formation in turbulent swirl-stabilized spray flames in a model combustor fueled with n-butanol/Jet A-1 blends, *Fuel*, Vol. 287, 119452, 2021.
doi:10.1016/j.fuel.2020.119452

[J.14] Rault M. T., Vishwanath, B. R., Gülder, Ö. L. Impact of ethanol blending on soot in turbulent swirl-stabilized Jet A-1 spray flames in a model gas turbine combustor, *Proceedings of the Combustion Institute*, Vol.38, pp. 6431–6439, 2021.
doi:10.1016/j.proci.2020.05.021

[J.15] Yang, S. S., Karataş, A. E., Gülder, Ö. L. Effect of hydrogen enrichment of laminar ethylene diffusion flames on thermal structure and soot yields at pressures up to 10 bar, *Proceedings of the Combustion Institute*, Vol.38, pp. 2507–2516, 2021.
doi:10.1016/j.proci.2020.06.157

[J.16] Gu, M., Liu, F., Consalvi, J.-L. and Gülder, Ö. L. Effects of pressure on soot formation in laminar coflow methane/air diffusion flames doped with n-heptane and toluene between 2 and 8 atm, *Proceedings of the Combustion Institute*, Vol.38, pp. 1403–1412, 2021.
doi:10.1016/j.proci.2020.07.032

[J.17] Yang, S. S. and Gülder, Ö. L. Effects of benzene, cyclo-hexane and n-hexane addition to methane on soot yields in high-pressure laminar diffusion flames, *Proceedings of the Combustion Institute*, Vol.38, pp. 1107–1114, 2021.
doi:10.1016/j.proci.2020.06.109

[J.18] Karataş, A. E., Gigone, B., Gülder, Ö. L. Soot aggregate morphology deduced from thermophoretic sampling in coflow laminar methane diffusion flames at pressures up to 30 bar, *Combustion and Flame*, Vol. 220, pp. 411-422, 2020.
doi:10.1016/j.combustflame.2020.09.009

[J.19] Yang, S. S., and Gülder, Ö. L. Pressure dependence of sooting characteristics of m-xylene and n-octane doped laminar methane diffusion flames from 2 to 10 bar, *Combustion and Flame*, Vol. 220, pp. 203-209, 2020.
doi:10.1016/j.combustflame.2020.06.043

[J.20] Rault M. T., Vishwanath, B. R., Gülder, Ö. L. Influence of m-xylene addition to Jet A-1 on spray structure, flow field and soot production in turbulent swirl-stabilized spray flames in a model combustor, *Combustion and Flame*, Vol. 219, pp. 258-267, 2020. doi:10.1016/j.combustflame.2020.05.025

[J.21] Commodo, M., Karataş, A. E., De Falco, G., Minutolo, P., D'Anna, A., Gülder, Ö. L. On the effect of pressure on soot nanostructure: A Raman spectroscopy investigation, *Combustion and Flame*, Vol. 219, pp. 13-19, 2020. doi:10.1016/j.combustflame.2020.04.008

[J.22] Wang, L.-Y, Chatterjee, S., An, Q., Steinberg, A. M., Gülder, Ö. L. Soot formation and flame structure in swirl-stabilized turbulent non-premixed methane combustion, *Combustion and Flame*, Vol. 209, pp. 303-312, 2019. doi:10.1016/j.combustflame.2019.07.033

[J.23] Khierkhah, S., Gülder, Ö. L. Comments on Tong et al.: "Experimental study on dynamics of confined low swirl partially premixed methane-hydrogen-air flame", *International Journal of Hydrogen Energy*, Vol. 44, pp. 17103-17104, 2019. doi:10.1016/j.ijhydene.2019.04.210

[J.24] Khierkhah, S., Gülder, Ö. L. A comment on papers by Zhou et al. (CNF, 2018) and Zhou et al. (CST, 2019): Flame displacement speed, flame front velocity, and edge (reactants) velocity, *Combustion and Flame*, Vol. 205, pp. 133-134, 2019. doi:10.1016/j.combustflame.2019.04.002

[J.25] Tamadonfar, P., Gülder, Ö. L. Comment on the paper "Experimental study of effect of hydrogen addition on combustion of low caloric value gas fuels", *International Journal of Hydrogen Energy*, Vol. 44, pp. 4006-4007, 2019. doi:10.1016/j.ijhydene.2018.12.006

[J.26] Gigone, B., Karataş, A. E., Gülder, Ö. L. Soot aggregate morphology in coflow laminar ethylene diffusion flames at elevated pressures, *Proceedings of the Combustion Institute*, Vol. 37, pp. 841-848, 2019. doi:10.1016/j.proci.2018.06.103

[J.27] Wang, L.-Y., Bauer, C. K., Gülder, Ö. L. Soot and flow field in turbulent swirl-stabilized spray flames of Jet A-1 in a model combustor, *Proceedings of the Combustion Institute*, Vol. 37, pp. 5437-5444, 2019. doi:10.1016/j.proci.2018.05.093

[J.28] Wang, W., Karataş, A. E., Groth, C. P. T., Gülder, Ö. L. Combined Experimental and Numerical Study of Ethanol Laminar Flame Extinction, *Combustion Science and Technology*, Vol. 190, pp. 1472-1487, 2018. doi:10.1080/00102202.2018.1452130

[J.29] Wang, W., Karataş, A. E., Groth, C. P. T., Gülder, Ö. L. Experimental and Numerical Study of Laminar Flame Extinction for Syngas and Syngas-Methane Blends, *Combustion Science and Technology*, Vol. 190, pp. 1455-1471, 2018. doi:10.1080/00102202.2018.1452128

[J.30] Griffin, E. A, Gülder, Ö. L. Soot formation in diluted laminar ethene, propene and 1-butene diffusion flames at elevated pressures, *Combustion and Flame*, Vol. 197, pp. 378-388, 2018.
doi:10.1016/j.combustflame.2018.08.010

[J.31] Griffin, E. A, Christensen, M., Gülder, Ö. L. Effect of ethanol addition on soot formation in laminar methane diffusion flames at pressures above atmospheric, *Combustion and Flame*, Vol. 193, pp. 306-312, 2018.
doi:10.1016/j.combustflame.2018.04.001

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9.4 Refereed Conference Papers

[C.1] Rajan, Y.T., Karataş, A. E. and Gülder, Ö. L. "Effect of reactant preheating on soot properties in laminar diffusion flames of ethylene", 13th Mediterranean Combustion Symposium, Corfu, Greece, June 1–5, 2025.

[C.2] Chelem Mayigue, C., Jahncke, I., Taddesse, T., Groth, C. P. T., Roy, A., Sawanni, R., Rajan, Y., Chaudhuri, S., and Gülder, Ö. L. "Contrail formation simulation via FANS-based turbulence modelling combined with two-equation soot/ice particle transport modelling", AIAA 2025-0600, AIAA SciTech, January 6 - 10, 2025.

[C.3] Razavi, M. R. and Gülder, Ö. L. "Soot formation at high pressures in a temperature controlled micro flow reactor", 21st International Conference on Flow Dynamics, Sendai, Japan, November 18 - 20, 2024.

[C.4] Sawanni, R. and Gülder, Ö. L. "Pressure scaling of sooting processes in a counterflow diffusion flame from 1 to 6 bar", 21st International Conference on Flow Dynamics, Sendai, Japan, November 18 - 20, 2024.

[C.5] Razavi, M. R. and Gülder, Ö. L. "Pyrolysis and soot formation of liquid fuels in a micro flow reactor", 20th International Conference on Flow Dynamics, Sendai, Japan, November 6 - 8, 2023.

[C.6] Vishwanath, R. B., Carniglia, P. A., Weber, J. K., Gülder, Ö. L."Soot formation in swirl-stabilized spray combustion of Jet A-1 doped with n-pentanol in a laboratory gas turbine combustor", 12th Mediterranean Combustion Symposium, Luxor, Egypt, January 23 – 26, 2023.

[C.7] Vishwanath, R. B., Carniglia, P. A., Weber, J. K., Gülder, Ö. L."Influence of n-pentanol blending on soot in spray combustion of kerosene", 19th International Conference on Flow Dynamics, Sendai, Japan, November 9 - 11, 2022.

[C.8] Rault, M. T., Gülder, Ö. L."Influence of ethanol blending on soot in spray combustion of kerosene", 16th International Conference on Flow Dynamics, Sendai, Japan, November 6 - 8, 2019.

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[C.10] Karatas, A. E., Gigone, B., Gülder, Ö. L."Pressure Effects on Soot Morphology in Laminar Methane Diffusion Flames", 12th Asia-Pacific Conference on Combustion, Fukuoka, Japan, July 1 – 5, 2019.

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[C.12] Griffin, E. A., Gülder, Ö. L., "High Pressure Soot Formation in Laminar Diffusion Flames of C2-C4 Olefins", 15th International Conference on Flow Dynamics, Sendai, Japan, November 7 - 9, 2018.

[C.13] Wang, Y.-L., Gülder, Ö. L., "Soot Formation in Swirl-Stabilized Spray Combustion of Jet A-1 in a Model Gas Turbine Combustor", Asian Congress on Gas Turbines, Marioka, Japan, August 22-24, 2018.

[C.14] Wang, W., Karataş, A. E., Groth, C. P. T., and Gülder, Ö. L., "Experimental and numerical study of laminar flame extinction for syngas and syngas-methane blends", 10th Mediterranean Combustion Symposium, Naples, Italy, September 17-21, 2017.

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[C.29] Tamadonfar, P., and Gülder, Ö. L., "Experimental investigation of the internal structure of premixed turbulent methane/air flame fronts", 8th Mediterranean Combustion Symposium (on CD), September 2013, Cesme, Izmir.

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[O.76] M. E. Vaillancourt, P. M. Mandatori, H. I. Joo, and Ö. L. Gülder, "Laminar Diffusion Flames of Methane, Ethane and Propane at Elevated Pressures", Proceedings Combustion Institute / Canadian Section, Spring Technical Meeting, May 2007, Banff, AL.

[O.77] S. V. Puranam, D. Pavé, and Ö. L. Gülder, "Flame Surface Density Evaluations for Lean Premixed Turbulent Flames", Proceedings Combustion Institute / Canadian Section, 2006 Spring Technical Meeting, pp. G1.1-G1.6.

[O.78] D. Pavé, C. Chauveau, D. Davidenko, I. Gökalp, I. G. Shepherd, and Ö. L. Gülder, "Experimental Characterization on Structure of Lean Premixed Turbulent Methane-Air Flames: Strain, Curvature and Thickness", Proceedings Combustion Institute / Canadian Section, 2005 Spring Technical Meeting, pp.196-201.

[O.79] Ö. L. Gülder, "Burning Velocity Enhancement of Turbulent Flamelets in the Thin Reaction Zone Regime by Small Scale Turbulence", Proceedings Combustion Institute / Canadian Section, 2005 Spring Technical Meeting, pp.136-141.

[O.80] D. S. Bento, K. A. Thomson, Ö. L. Gülder, "Temperature and Soot Field in Laminar Diffusion Flames at Super-Atmospheric Pressures", Proceedings Combustion Institute / Canadian Section, 2005 Spring Technical Meeting, pp.4-9.

[O.81] Gülder, Ö. L., Guo, H., Liu, and F., Smallwood, G. J., "Hydrogen-Enriched Lean-Premixed Combustion" [Invited Lecture] Chemical Kinetics and Diffusion Processes in Reacting Flows, CDRF04 Abstract Book, pp. 22-24, June 7-9, 2004, Istanbul, Turkey.

[O.82] Thomson, K. A., Gülder, Ö. L., Weckman, E. J., Fraser, R. A., Smallwood, G. J., and Snelling, D. R., "Soot Concentration Profiles in a Non-premixed Methane Laminar Diffusion Flame at High Pressures", Proceedings Combustion Institute / Canadian Section, 2004 Spring Technical Meeting, pp. Q2.1-Q2.6, May 10-12, Kingston, ON, 2004.

[O.83] Gülder, Ö. L., "Characteristics of Flame Front Surfaces in Turbulent Premixed Combustion", [Invited Keynote Presentation] Combustion Institute / Canadian Section, 2003 Spring Technical Meeting, May 11-14, Vancouver, BC, 2003.

[O.84] Thomson, K. A., Gülder, Ö. L., Weckman, E. J., Fraser, R. A., and Smallwood, G. J., "Preliminary Characterization of a High-Pressure Laminar Diffusion Flame Combustion Facility", Combustion Institute / Canadian Section, 2003 Spring Technical Meeting, May 11-14, Vancouver, BC, 2003.

[O.85] Smallwood, G. J., Snelling, D. R., Witze, P.O., Axelsson, B., Bachalo, W. D., and Gülder, Ö. L., "Comparison of Quantitative LII and SMPS Measurements of Particulate Emissions from a TDI Diesel Engine", Proceedings Twenty-Fourth Task Leaders Meeting (IEA), pp.239-253, June 2002, Trondheim, Norway.

[O.86] Guo, H., Liu, F., Smallwood, G. J., and Gülder, Ö. L., "Numerical Investigation of the Thermal Diffusion Influence on Soot Formation in Ethylene/Air Diffusion Flames", Proceedings of the 10th Annual Conference of the CFD Society of Canada, Windsor, Ontario, June 2002.

[O.87] Thomson, K. A., Gülder, Ö. L., Weckman, E. J., Fraser, R. A., and Snelling, D. R., "A New Diffusion Flame Burner and Pressure Vessel for High Pressure Soot Formation Study", Combustion Institute / Canadian Section, 2002 Spring Technical Meeting, pp.2.1-2.7, May 13-15, Windsor, Ontario, 2002.

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[O.90] Guo, H., Liu, F., Smallwood, G. J., and Gülder, Ö. L., "The Inlet Boundary Condition Effect on the Numerical Modeling of a Two Dimensional Laminar Ethylene-Air Diffusion Flame", Proceedings of the 9th Annual Conference of the CFD Society of Canada, pp.418-423, June 2001.

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[O.93] Liu, F., and Gülder, Ö. L., "Calculations of the 2D Cavity Flow Using A Finite-Difference Based Lattice Boltzmann Method", Proceedings of the 8th Annual Conference of the CFD Society of Canada, Vol.2, pp.575-580, 2000.

[O.94] Guo, H., Liu, F., Smallwood, G. J., and Gülder, Ö. L., "Numerical Simulation of a Coflow Laminar Diffusion C2H4/Air Flame", Combustion Institute / Canadian Section, 2000 Spring Technical Meeting, pp.2.1-2.5, 2000.

[O.95] Liu, F., Guo, H., Smallwood, G. J., and Gülder, Ö. L., "Numerical Study of the Chemical Effects of CO2 Dilution on Counterflow Laminar C2H4/Air Diffusion Flame", Combustion Institute / Canadian Section, 2000 Spring Technical Meeting, pp.6.1-6.5, 2000.

[O.96] Gülder, Ö. L., Thomson, K. A., and Snelling, D. R., "Influence of the Fuel Nozzle Material on Soot Formation and Temperature Field in Coflow Laminar Diffusion Flames", Combustion Institute / Canadian Section, 2000 Spring Technical Meeting, pp.20.1-20.6, 2000.

[O.97] Campbell, I. G., Smallwood, G. J., Gülder, Ö. L., Snelling, D. R., "Pressure Atomizer Spray Field Velocity Analysis using Two-Color PIV", ILASS-Americas'99, 12th Annual Conference on Liquid Atomization and Spray Systems, poster, May 17-19, Indianapolis, IN, 1999.

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[O.100] Snelling, D. R., Thomson, K. A., Smallwood, G. J., and Gülder, Ö. L., "Two-Dimensional Imaging of Soot Volume Fraction in Laminar Diffusion Flames", Combustion Institute / Canadian Section, 1998 Spring Technical Meeting, pp. 4.1-4.6, 1998.

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[O.103] Liu, F., Smallwood, G. J., Snelling, D. R., and Gülder, Ö. L., "A Ray-Tracing Method for Solving the Radiative Transfer Equations in Three-Dimensional Participating Media", Combustion Institute / Canadian Section, 1997 Spring Technical Meeting, pp. 1.17-1.20, 1997.

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[O.106] Li, X., Chippior, W. L., and Gülder, Ö. L., "Effects of Cetane Number and Cetane Improver on Exhaust Emissions of a Single Cylinder DI Diesel Engine", Combustion Institute / Canadian Section, 1996 Spring Technical Meeting, pp. 14.1-14.4, 1996.

[O.107] Gülder, Ö. L., Smallwood, G. J., Wong, R., Snelling, D. R., Smith, R., Deschamps, B. M., and Sautet, J.-C., "Flame Front Surface Characteristics in Turbulent Premixed Propane/Air Combustion" Combustion Institute / Canadian Section, 1996 Spring Technical Meeting, pp. 50.1-50.6, 1996.

[O.108] Gülder, Ö. L., "Canadian Diesel Fuel Composition and Exhaust Emissions: Critical Issues and Research Needs" Invited Paper, Combustion Institute / Canadian Section, 1995 Spring Technical Meeting, University of Victoria, B.C., May 23-26, 1995.

[O.109] Deschamps, B. M., Smallwood, G. J., Snelling, D. R., Gökalp, I., and Gülder, Ö. L., "Axial Evolution of Flame Front Surface Characteristics in Conical Turbulent Premixed Methane / Air Flames", 25th International Combustion Symposium, Poster No. 2/32, 1994.

[O.110] Gülder, Ö. L., and Baksh, M. F., "Influence of Hydrogen Addition to Fuel on Soot Formation in Diffusion Flames", Combustion Institute / Canadian Section, 1994 Spring Technical Meeting, Paper No.41, pp.41.1-41.5, May 11-13, 1994, Kingston, On.

[O.111] Baksh, M. F., and Gülder, Ö. L., "Effects of Oxygen on Soot Formation in Methane, Propane, and n-Butane Diffusion Flames", Combustion Institute / Canadian Section, 1994 Spring Technical Meeting, Paper No.44, pp.44.1-44.5, May 11-13, 1994, Kingston, On.

[O.112] Wong, R., Snelling, D. R., Smallwood, G. J., Smith, R., and Gülder, Ö. L., "Fractal Characteristics of Turbulent Premixed Propane / Air Flames Measured by OH PLIF and LMS", Combustion Institute / Canadian Section, 1994 Spring Technical Meeting, Paper No.58, pp.58.1-58.4, May 11-13, 1994, Kingston, On.

[O.113] Smallwood, G. J., Gülder, Ö. L., Snelling, D. R., "Transmission and Scattering Characteristics of the Dense Core Region in Transient Diesel Sprays", Combustion Institute / Canadian Section, 1994 Spring Technical Meeting, Paper No.78, pp.78.1-78.5, May 11-13, 1994, Kingston, On.

[O.114] Smallwood, G. J., Deschamps, B. M., Gülder, Ö. L., and Snelling, D. R., "Variation of Flame Front Geometry in Conical Turbulent Premixed Methane / Air Flames", Combustion Institute / Canadian Section, 1994 Spring Technical Meeting, Paper No.61, p.61.1-61.5, May 11-13, 1994, Kingston, On.

[O.115] Gülder, Ö. L., Glavincevski, B., and Battista, V., "Visibility of Methanol Pool Flames", 1993 Windsor Workshop on Alternative Transportation Fuels, June 14 - 17, 1993, Toronto, On.

[O.116] Wong, R., Sautet, J. -C., Snelling, D. R., Smallwood, G. J., and Gülder, Ö. L., "2-D Profiles of the Flame Front in Turbulent Premixed Flames Using Laser Induced Fluorescence and Laser Mie Scattering", Combustion Institute / Canadian Section, 1993 Spring Technical Meeting, Paper No. 8, pp. 8.1 - 8.5, May 9-11, 1993, Québec QC.

[O.117] Snelling, D. R., Gülder, Ö. L., Sawchuk, R. A., and Parameswaran, T., "CARS Temperature Measurements in a Sooting Laminar Diffusion Flame", Combustion Institute / Canadian Section, 1993 Spring Technical Meeting, Paper No. 9, pp. 9.1 - 9.5, May 9-11, 1993, Québec QC.

[O.118] Deschamps, B. M., Gülder, Ö. L., Smallwood, G. J., Snelling, D. R., Bjorn, P. V., and Gökalp, I., "Characteristics of the Turbulent Premixed Methane / Air Flame Front Surfaces", Combustion Institute / Canadian Section, 1993 Spring Technical Meeting, Paper No.28, pp.28.1 -28.5, May 9-11, 1993, Québec QC.

[O.119] Gülder, Ö. L., and Baksh, M. F., "Influence of Carbon Dioxide Dilution on Soot Formation in Diffusive Combustion", Combustion Institute / Canadian Section, 1993 Spring Technical Meeting, Paper No.40, pp.40.1 -40.5, May 9-11, 1993, Québec QC.

[O.120] Smallwood, G. J., Gülder, Ö. L., and Snelling, D. R., "Dense Core Region Structure of Transient Diesel Sprays", ILASS-Americas 92, 5th Annual Conference on Liquid Atomization and Spray Systems, pp.43-47, May 18-20, 1992, San Ramon, CA.

[O.121] Gülder, Ö. L., and Snelling, D. R., "Flame Temperature and Dilution Effects on Soot Formation in Diffusion Flames", Combustion Institute / Canadian Section, 1992 Spring Technical Meeting, Paper No.92-28, pp.88-91, May 11-13, 1992, Edmonton, Alberta.

[O.122] Gülder, Ö. L., and Baksh, M. F., "Influence of Sulphur Dioxide on Soot Formation in Diffusion Flames", Combustion Institute / Canadian Section, 1992 Spring Technical Meeting, Paper No.92-29, pp.92-95,May 11-13, 1992, Edmonton, Alberta.

[O.123] Aval, S. M., Gülder, Ö. L., Smallwood, G. J., and Snelling, D. R., "Interrogation of the Diesel Spray Structure by Laser Tomography and Diffraction", Combustion Institute / Canadian Section, 1991 Spring Technical Meeting, Paper No. 38, p.136, May 29-31, 1991, Ottawa, Ontario.

[O.124] Gülder, Ö. L., "A Turbulent Premixed Flame Propagation Model for the Wrinkled Flame Regime", Combustion Institute/Canadian Section, 1991 Spring Technical Meeting, Paper No. 18, pp.65-68, May 29 -31, 1991, Ottawa, Ontario.

[O.125] Gülder, Ö. L., and Baksh, M. F., "Soot Formation in Laminar Diffusion Flames at Elevated Temperatures", Combustion Institute / Canadian Section, 1991 Spring Technical Meeting, Paper No. 7, pp.26-29, May 29 -31, 1991, Ottawa, Ontario.

[O.126] Gülder, Ö. L., Glavincevski, B., Baksh, M. F., and Burton, G. F., "Influence of Fuel-Bound Sulfur on Soot Formation in Laminar Diffusion Flames of Liquid Hydrocarbons", Combustion Institute/Eastern Section, 1990 Fall Technical Meeting, Paper No.127, December 3-5, 1990, Orlando, FL.

[O.127] Gülder, Ö. L., and Snelling, D. R., "Formation and Temperature of Soot Particles in Laminar Diffusion Flames with Elevated Temperatures", Combustion Institute/Canadian Section, 1990 Spring Technical Meeting, pp.192-197, April 28-May 2, 1990, Banff, Alberta.

[O.128] Gülder, Ö. L., "Turbulent Premixed Combustion Modelling Using Fractal Geometry", Combustion Institute/Canadian Section, 1990 Spring Technical Meeting, pp. 42-47, April 28-May 2, 1990, Banff, Alberta.

[O.129] Gülder, Ö. L., "Soot Radiation in Laminar Diffusion Flames", Combustion Institute/Canadian Section, 1989 Spring Technical Meeting Proc. pp.45-48, May 31-June 2, 1989, Toronto.

[O.130] Gülder, Ö. L., and Glavincevski, B., "Influence of Hydrocarbon Fuel Structural Constitution on Soot Formation in Laminar Diffusion Flames", 22nd International Symposium on Combustion, Poster No. 25, August 14-18, 1988.

[O.131] Gülder, Ö. L., "Temporally and Spatially Resolved Drop Sizing of Dense Sprays", Proc. of 2nd ILASS Conference, pp.78-81, May 18-20, 1988, Pittsburgh, PA.

[O.132] Gülder, Ö.L., and Glavincevski, B., "Effects of Flame Temperature and Fuel Structural Features on Soot Formation in Laminar Diffusion Flames", Combustion Institute/Canadian Section, 1988 Spring Technical Meeting, June 1-3, 1988, Halifax,N.S.

[O.133] Gülder, Ö. L., and Glavincevski, B., "Soot Formation Characteristics of Gas Turbine Fuels - Effects of Hydrocarbon Structural Composition", Workshop on Alternative Fuels for Transportation: Canadian Research Needs, May 9,10, 1988, NRC, Ottawa, Ontario.

[O.134] Gülder, Ö.L., "Multiple Scattering Effects in Drop Sizing of Dense Fuel Sprays by Laser Diffraction", AGARD / NATO PEP 70th Symp. on Combustion and Fuels in Gas Turbine Engines, AGARD CP-422, pp.7.1-7.15, 1988.

[O.135] Gülder, Ö. L., and Baksh, M. F., "Drop Size Distribution in Dense Diesel Sprays", Combustion Institute/Canadian Section, 1987 Spring Technical Meeting, May 28-29, 1987, Vancouver, B.C.

[O.136] Gülder, Ö. L., "Multiple Scattering Effects in Laser Diffraction Measurements of Dense Sprays with Bi-modal Size Distributions", 1st Annual Conference of ILASS-Americas,June 9-11, Madison, WI, 1987.

[O.137] Gülder, Ö. L., Billingham, R., and Chellingworth, F. W., "Intermittent Spray Characterization and Spray Ignition at High Pressure and Temperature: Description of an Experimental Set-Up", Joint Technical Meeting of the Canadian and Western States Sections/The Combustion Institute, Paper no. 91, April 1986, Bannf, Alberta.

[O.138] Gülder, Ö. L., "Transient Heating and Evaporation of a Fuel Droplet with Non-Uniform Surface Temperature on a Hot Horizontal Plate", 21st International Symposium on Combustion, Poster No.74, Munich, Germany, August 1986.

[O.139] Gülder, Ö. L., "An Expression for the Enthalpy of Vaporization of Hydrocarbons between their Triple Points and Critical Points", Combustion Institute / Canadian Section 1985 Spring Technical Meeting Paper no.13, May 1985, Waterloo, Ontario.

[O.140] Glavincevski, B., and Gülder, Ö. L., "Cetane Number Prediction of Diesel Fuels from Hydrogen Type Structural Composition," Combustion Institute / Canadian Section 1985 Spring Technical Meeting, Paper no.4, May 1985, Waterloo, Ontario.

[O.141] Gülder, Ö. L., and Wong, J. K. S., "Evaporation of Fuel Droplets on a Heated Surface", Combustion Institute / Canadian Section, 1984 Spring Technical Meeting, Paper no. 23, May 1984, Fredericton, New Brunswick.

[O.142] Gülder, Ö. L., "Flame Temperature Estimation Of Diesel and Gas Turbine Fuels," Combustion Institute/Eastern States Section, 1984 Fall Meeting, Paper no.38, December 1984, Clearwater , FL.

[O.143] Gülder, Ö. L., "Laminar Burning Velocities of Ethanol, Isooctane, and Isooctane / Ethanol Blends in Air", Combustion Institute / Canadian Section, 1983 Spring Technical Meeting, Paper no.14 ,May 1983, Kingston, Ontario.

[O.144] Gülder, Ö. L., "Alternative I.C. Engine Fuels and Air Pollution", in Proceedings of Seminar on Alternative Energy Sources and Environmental Pollution, (Edited by Y. Yener, and B. Kilkis), pp.1-15, Ankara, 1980.

9.6 Keynote / Plenary / Invited Presentations

[KPI.1] Rault, M. T., Gülder, Ö. L."Influence of ethanol blending on soot in spray combustion of kerosene", 16th International Conference on Flow Dynamics, Sendai, Japan, November 6 - 8, 2019 (Invited)

[KPI.2] Gülder, Ö. L., "What have we learned from high pressure soot studies – on track to finding a soothing solution or falling into a black hole?", Combustion Institute - Canadian Section Spring Technical Meeting, The University of British Columbia, Kelowna, May 13-16, 2019 (Plenary)

[KPI.3] Griffin E. A. and Gülder, Ö. L., "High Pressure Soot Formation in Laminar Diffusion Flames of C2-C4 Olefins", 15th International Conference on Flow Dynamics, Sendai, Japan, November 7 - 9, 2018 (Invited)

[KPI.4] Gülder, Ö. L., "Soot aerosol formation and morphology in high pressure combustion", KAUST Research Conference: Combustion in Extreme Conditions, KAUST Saudi Arabia, March 5-8, 2018 (Invited)

[KPI.5] Gülder, Ö. L., "Uncertainty analysis in soot measurements at high pressures", Invited reflections. 3rd International Sooting Flame Workshop, Seoul, Korea, August 2016.

[KPI.6] Gülder, Ö. L., "Soot aerosol formation in high pressure combustion", Princeton University, October 16, 2015, Princeton, N.J. (Invited)

[KPI.7] Gülder, Ö. L., "Soot aerosol formation at high pressures in laminar diffusion flames", XXXVIII Meeting of the Italian Section of the Combustion Institute, Lecce – September 20-23, 2015. (Plenary)

[KPI.8] Gülder, Ö. L., "Prospects of biofuels in aviation", The National Colloquium on Sustainable Aviation, May 27-28, 2015, Toronto, ON. (Invited)

[KPI.9] Gülder, Ö. L., "What are the criteria for the validity of flamelet assumption?" 14th International Workshop on Premixed Turbulent Flames, August 1-2, 2014, San Francisco, CA. (Invited)

[KPI.10] Gülder, Ö. L., "Premixed turbulent flame front structure and the limits of flamelet assumption", University of Orléans and CNRS, December 05, 2012, Orléans, France. (Invited)

[KPI.11] Gülder, Ö. L., "Biofuels for aviation: challenges and sustainability", Canada in Aviation and Space: Past, Present and Future, CAE Symposium, June 22, 2012, Ottawa, ON.(Invited)

[KPI.12] Gülder, Ö. L., "Structure of premixed turbulent flames and validity range of flamelet hypothesis", 7th Int'l Seminar on Flame Structure, July 2011, Novosibirsk, Russia. (Plenary)

[KPI.13] Gülder, Ö. L., "Dynamics and structure of premixed turbulent flames", International Workshop on Turbulent Ignition and Flame Propagation, July 2010, Taipei, Taiwan. (Invited)

[KPI.14] Gülder, Ö. L., "Combustion research for alternative fuels, energy efficiency and emissions reduction", University of Orléans, June 25, 2009, Orléans, France. (Invited)

[KPI.15] Gülder, Ö. L., "A critical assessment of bio-fuels for aviation", The UTIAS-MITACS International Workshop on Aviation and Climate Change, May 29-30, 2008, Toronto, ON. (Invited)

[KPI.16] Gülder, Ö. L., "Combustion of alternative fuels in engines", European Union Marie-Curie Conference on Fuels and Combustion in Engines, March 31-April 1, 2008, Istanbul, Turkey. (Invited)

[KPI.17] Gülder, Ö. L., "Temperature and Soot Field Measurements in Atmospheric and High-Pressure Laminar Diffusion Flames", Sandia National Laboratories - Utah Workshop on Heat Transfer in Pool Fires, April 12-13, 2005, Livermore, CA. (Invited)

[KPI.18] Gülder, Ö. L., "Recent Developments in Lean Premixed Flame Studies", Workshop on Combustion Science & Technology for Advanced Gas Turbines, March 28-30, 2005, Istanbul, Turkey. (Invited)

[KPI.19] Gülder, Ö. L., "Characteristics of Flame Front Surfaces in Premixed Combustion", Front Propagation and Nonlinear Stochastic PDEs for Combustion and other Applications, CRM Université de Montréal, January 26-29, 2005, Montréal, QC. (Invited)

[KPI.20] Gülder, Ö. L., "Properties of Turbulent Premixed Flame Surfaces", Zeldovich Memorial II – International Conference on Combustion and Detonation, August 30-September 3, 2004, Moscow, Russia. (Plenary)

[KPI.21] Gülder, Ö. L., "Hydrogen-Enriched Lean-Premixed Flames", Workshop on Chemical Kinetics & Diffusion Processes in Reacting Flows, 7-9 June 2004, Istanbul, Turkey. (Invited)

[KPI.22] Gülder, Ö. L., "Characteristics of Flame Front Surfaces in Turbulent Premixed Combustion", Combustion Institute / Canadian Section, 2003 Spring Technical Meeting, May 11-14, Vancouver, BC, 2003. (Plenary)

[KPI.23] Gülder, Ö. L., "Soot Particulate Formation and Characterization in Combustion", Tsinghua University, Beijing, China, March 21, 2001 (on the occasion of the 90th Anniversary of the University). (Invited)

[KPI.24] Gülder, Ö. L. and Smallwood, G. J., "Views on the Structure of Transient Diesel Sprays" ICLASS 2000: 8th International Conference on Liquid Atomization and Spray Systems, July 2000, Pasadena, CA. (Plenary)

[KPI.25] Gülder, Ö. L., "The Breakup and Structure of Diesel Sprays" 3rd Symposium, Towards Clean Diesel Engines, 15-16 June 2000, IFP, Rueil-Malmaison, France. (Invited)

[KPI.26] Gülder, Ö. L., "Fractal Characteristics and Surface Density of Flame Fronts in Turbulent Premixed Combustion" 1st Mediterranean Combustion Symposium (International), June 20-25, 1999, Antalya, Turkey. (Plenary)

[KPI.27] Gülder, Ö. L., "Time-Resolved Structure of Full Cone Diesel Sprays", Second International Workshop on Advanced Spray Combustion, (Proc. Second International Workshop on Advanced Spray Combustion, pp. 29 – 38), November 1998, Hiroshima, Japan. (Invited)

[KPI.28] Gülder, Ö. L., "Soot Particulate Formation and Characterization in Combustion", Canadian Society for Mechanical Engineering Forum 1998, (Transactions of the Canadian Society for Mechanical Engineering, vol. 23, n.1B, pp. 225-240, 1999), May 1998, Toronto, Ontario. (Invited)

[KPI.29] Gülder, Ö. L., "Surface Density Measurements of Turbulent Premixed Flames in a Spark-Ignition Engine and a Bunsen-Type Burner Using Planar Laser-Induced Fluorescence", ERCOFTAC (European Research Centers on Flow, Turbulence and Combustion) 1996 Conference, June 1996, Paul Scherrer Institut (PSI), Würenlingen, Switzerland. (Plenary)

10 Research Grants / Equipment Grants / Contracts

Dates	Grantor	Grant type (PI or co-PI)	Topic	Amount $CAD
2024-2028	ORF, Pratt and Whitney Canada	Research Excellence (co-PI)	Hydrogen as a sustainable aviation fuel - Combustion research to remove impediments to adoption in gas turbine engines (Groth, PI; Devaud & Chaudhuri, Co-PIs)	1,980,000 (over 4 yrs)
2023-2026	NSERC, Pratt and Whitney Canada	Alliance (PI)	Near-future aviation fuels: Synthesis, testing, and GHG emissions (Devaud, Bushe, Kheirkhah and Upham, Co-PIs)	1,500,000 (over 3 yrs)

2022-2024	NSERC, Pratt and Whitney Canada	Alliance (PI)	Reducing Aviation's Impact on Climate Change - Understanding Effects of Fuel and Engine Characteristics on Formation of Contrails (Groth and Chaudhuri, Co-PIs)	951,000 (over 2 yrs)
2021-2023	CFI – JELF	Infrastructure (Co-PI)	Kinetics-transport interaction towards deposition of carbon particulates in meso-channel supercritical fuel flows (S. Chaudhuri, PI)	248,343
2021-2029	CFI	CFI NI Operational (PI)	High-pressure blow-down facility for gas turbine combustion research	615,000
2020-2022	NSERC	Equipment (PI)	A comprehensive research platform for measuring combustion generated soot nanoparticle morphology and pressure sensitivity at elevated pressures	69,250
2017-2023	NSERC	Discovery Grant (PI)	Fundamental flame studies of soot formation and morphology at elevated pressures	456,000 (over 6 yrs)
2016-2024	ORF	Research Excellence (PI)	Next Generation Low Emission Combustor Technologies for High-Efficiency Compact Aviation Gas Turbine Engines (Groth, Chaudhuri, Devaud, Co-PIs)	3,104,249
2015-2017	BIOFUEL NET	NCE	Particulate matter/soot aerosol formation propensities and thermal oxidative stability of biojet fuels at elevated pressures	110,00 (over 2 yrs)
2015-2017	NSERC	Equipment (PI)	Filtered Rayleigh scattering instrumentation for diagnostics of high-pressure combustion systems emitting nano soot aerosols	148,500
2014-2016	NSERC	Equipment (PI)	An experimental platform for nano-soot particle diagnostics and characterization for high	147,000

			pressure combustion	
2013-2024	CFI, OIT, Pratt and Whitney	CFI NI Infrastructure (PI)	High-pressure blow-down facility for gas turbine combustion research	5,100,000
2012-2015	NSERC, Rolls Royce, Pratt and Whitney	Strategic Project Grant (PI)	Environmental performance, sustainability and durability improvements in fuel-flexible combustors for stationary and motive engines (three other Co-PIs)	746,000 (over 3yrs)
2012-2017	NSERC	CREATE (Co-PI)	Industrial Stream NSERC CREATE Research and Training Program in Environmentally Sustainable Aviation (11 other Co-PIs)	1,650,00 (over 5 yrs)
2012-2013	NSERC RTI	Equipment (PI)	Swirl-stabilized burner for premixed and spray combustion	81,177
2012-2016	NSERC	Discovery (PI)	Fundamental flame studies of soot formation at high pressures and at low gravity	280,000 (over 5 yrs)
2011-2015	Pratt and Whitney, NSERC	Industrial Executive Research Chair (Co-PI)	Combustion and emissions (Sampath, PI) (2 other Co-PIs)	1,000,000 (over 5 yrs)
2011-2013	GARDN, Pratt and Whitney	Contract (PI)	Altitude emission control for aviation	252,000
2008-2009	NSERC RTI	Equipment (PI)	Stereo Particle Image Velocimetry System for Combustion and Turbulence Studies	145,034
2007-2010	Canadian Space Agency	Research Grant (PI)	Effects of gravity, buoyancy and differential diffusion on the structure of non-premixed flames	201,000
2007-2010	Pratt and Whitney	Contract (Co-PI)	Thermal Stability of Aviation Turbine Fuels (Groth, PI)	555,200
2007-2012	NSERC	Discovery (PI)	Fundamental Flame Studies of Turbulent Premixed	215,000

			Combustion	
2006-2007	NSERC RTI	Equipment (PI)	A liquid fuel laminar diffusion flame burner for soot studies at high pressures	46,808
2005-2009	AUTO21	Research Grant (Co-PI)	Combustion of low-emission automotive tailored natural gas	76,875
2005-2006	NSERC RTI	Equipment (PI)	Components to build a laser-induced incandescence (LII) instrument for soot diagnostics	95,000
2004-2005	NSERC RTI	Equipment (PI)	A counter-flow flame burner system to study synergistic effects of gas mixtures on soot formation	23,020
2003-2004	NSERC RTI	Equipment (PI)	Planar Rayleigh scattering for temperature imaging	134,700
2003-2004	CFI, OIT New Opps	Infrastructure (PI)	High-Pressure Combustion Facility for Soot Research	500,000
2002-2005	NSERC	CRO (PI)	Dynamics and Structure of Lean Premixed Flames (Groth, Co-PI)	660,000
2002-2003	UTIAS	Startup (PI)	Fundamental flame studies	40,000
2002-2007	NSERC	Discovery (PI)	Turbulent premixed and partially premixed combustion	190,000

11 Professional Service Activities

11.1 Journal Editorial Boards

- Associate Editor: Proceedings of the Institution of Mechanical Engineers, Part G: Journal of Aerospace Engineering, 2019-2022
- Editorial Board, Combustion and Flame, 2001-2009
- Editorial Board, International Journal of Engine Research, 2000-2004
- Editorial Board, International Journal of Thermal Sciences, 1996-2007
- Editorial Board, Journal of Atomization and Sprays, 1990-1996

11.2 Professional Societies

- Board of Directors, The Combustion Institute, 2000-2012

- Chair, Canadian Section, The Combustion Institute, 1991- 2001
- Board of Directors, The Combustion Institute, Canadian Section, 1989-2006
- Board of Directors, Institute for Liquid Atomization and Spray Systems, 1987-1994

11.3 Professional Society Membership

- Combustion Institute – Fellow
- Canadian Academy of Engineering – Fellow
- American Society of Mechanical Engineers
- American Institute of Aeronautics and Astronautics – Associate Fellow
- Institute for Liquid Atomization and Spray Systems

11.4 Advisory Responsibilities

- Member, NSERC Mechanical Engineering Grant Selection Committee, 1992-1995.
- Scientific Adviser, Canadian Space Agency (Microgravity Combustion), 1989-1994.
- Canadian Delegate, International Energy Agency – Working Group on Energy Conservation and Emissions Reduction in Combustion, 1988-2001.
- Canadian Member, Executive Committee, International Energy Agency - Working Group on Energy Conservation and Emissions Reduction in Combustion, 1991-2009 (Chair 2004-2005).
- PERD Advanced Fuels & Transportation Emissions Reduction POL leader, 1999-2001.
- Canadian Space Agency, Physical Sciences Advisory Committee, 2007-2010.

11.5 Scientific/Technical Meeting Organization

- Scientific Advisory Board Member, Mediterranean Combustion Symposium (biennial) since 2015.
- Co-organizer of 15th International Workshop on Premixed Turbulent Combustion, July 27-28, 2018, Dublin, Ireland.
- Scientific Advisory Committee Member, International Sooting Flame Workshop, July 27-28, 2018, Dublin, Ireland.
- Co-organizer of 15th International Workshop on Premixed Turbulent Combustion, July 29, 2016, Seoul, Korea.
- Scientific Advisory Committee Member, International Sooting Flame Workshop, July 30-31, 2016, Seoul, Korea.
- Co-organizer of 14th International Workshop on Premixed Turbulent Combustion, August 2014, San Francisco, USA.

- Colloquium Chair (Turbulent Combustion), 35th Int'l Symposium on Combustion, August 2014, San Francisco, USA.
- Co-organizer of 13th International Workshop on Premixed Turbulent Combustion, July 28-29, 2012, Warsaw, Poland.
- Scientific Advisory Committee Member, International Sooting Flame Workshop, July 28-29, 2012, Warsaw, Poland.
- Colloquium co-chair (Turbulent Combustion), 34th Int'l Symposium on Combustion, August 2012, Warsaw, Poland.
- Co-chair of Combustion Institute Canadian Section Spring Technical Meeting, May 2012, University of Toronto, Toronto.
- Co-organizer of 12th International Workshop on Premixed Turbulent Combustion, August 2010, Beijing, China.
- Co-organizer of 11th International Workshop on Premixed Turbulent Combustion, August 2008, McGill University, Montreal.
- Co-chair of Combustion Institute Canadian Section Spring Technical Meeting, May 2008, University of Toronto, Toronto.
- Colloquium co-chair (Pollutants formation and control) of biennial Mediterranean Combustion Symposia, 1999-present.
- Scientific Committee member, 6th International Seminar on Flame Structure, September 14-17, 2008, Brussels, Belgium.
- Scientific Committee member, Zeldovich Memorial II – International Conference on Combustion and Detonation, August 30-September 3, 2004, Moscow, Russia.

11.6 Reviewing Activities

- Member, Papers Subcommittee, The Combustion Institute, 1990- present.
- Reviewer for the following journals: Combustion and Flame, Journal of Fluid Mechanics, AIAA Journal, Physics of Fluids, Optic Letters, Combustion Theory and Modelling, Combustion Science and Technology, Progress in Energy and Combustion Science, Experimental Thermal and Fluid Science, International Journal of Thermal Sciences, Journal of Gas Turbines and Power (ASME), Atomization and Sprays, Applied Optics, Energy and Fuels (ACS), Industrial and Engineering Chemistry (ACS), Fuel, International Journal of Engine Research, Proceedings of the Combustion Institute, Energy Conversion and Management.
- Reviewer for following granting agencies: NSERC, Canadian Space Agency, PERD, US Army Office of Basic Research, NSF, DoE, Australian Research Council, Swiss National Science Foundation, KAUST Research Funding Programs.
- Bernard Lewis Fellowship Committee of the Combustion Institute, 2000-2004
- Nominations Committee of The Combustion Institute, 2003-2008
- Site Selection Committee of The Combustion Institute, 2007-2010

- Ontario Graduate Scholarship Panel (Aerospace), 2005-2010 (Chair 2006-2008)
- Combustion Institute Gold Medal Nomination Committee Chair (2019-2020)

12 University and Departmental Assignments/Committees

12.1 Faculty

- Senior Promotions Committee (2008-present)
- Vice-Dean Search Committee (2006)

12.2 UTIAS

- Associate Director (2007-2016)
- CPPF (2001-present)
- Curriculum Committee (2002-2006)
- Tenure Committees (2005, 2008, 2022)
- Strategic Planning Committee (2007)
- Promotions Committee (2007-present)
- Honours Committee (2007-present)
- Alumni Committee (2007-2013)
- New Faculty Search Committees (2007, 2008, 2010, 2011, 2017/2018)