

Prof. M Reza Kholghy

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I. Education

- 2016 PhD, Mechanical Engineering, University of Toronto, Canada.
- 2012 MSc, Mechanical Engineering, University of Toronto, Canada.
- 2010 BSc, Aerospace Engineering, Sharif University of Technology, Iran.

II. Employment

- 2019 - now Assistant Professor, Carleton University, Canada.
- 2017 - 2019 Research Associate and Lecturer, ETH Zürich, Switzerland.
- 2016 - 2017 Course Instructor, University of Toronto, Canada.
- 2010 - 2016 Research & Teaching Assistant, University of Toronto, Canada.

III. Awards, Scholarships & Fellowships

- 2019 Canada Research Chair in Particle Technology & Combustion Engineering.
- 2017 Natural Research Council of Canada postdoctoral fellowship.
- 2013 Natural Research Council of Canada Vanier PhD scholarship.
- 2016 Natural Research Council of Canada Michael Smith supplement award.
- 2016 BioFuelNet Canada exchange award.
- 2012 Pierre Rivard Hydrogenics graduate fellowship.
- 2014 Neil Duncan Thompson graduate fellowship.
- 2012 Best oral presentation award in fluid mechanics, 3rd MIE symposium, Toronto.

IV. Publications

16 published, citations: 545, H-index: 12, H10-index: 13

16. Kelesidis, G.A., **Kholghy, M.R.**, Zuercher, J., Robertz, J., Allemann, M., Duric, A., and Pratsinis, S.E., “Light scattering from nanoparticle agglomerates”, *Powder Technology*, in press, (2019).
15. **Kholghy, M.R.**, Eaves, N.A., Veshkini, A., and Thomson, M.J., “The role of reactive PAH dimerization in reducing soot nucleation reversibility”, *Proceedings of the Combustion Institute*, 37, 1003, (2019).
14. Saggese, C., Singh, A.V., Xue, X., Chu, C., **Kholghy, M.R.**, Zhang, T., Thomson, M.J., Sung, C., Wang, H., “Effect of distillate fraction of real Jet fuel on sooting propensity”, *Fuel*, 235, 350 (2019).
13. Zhang, T., Zhao, L., **Kholghy, M.R.**, and Thomson, M. J., “Detailed simulation of soot formation for Jet fuel with Hybrid Chemistry (HyChem) and comprehensive chemistry kinetic models”, *Proceedings of the Combustion Institute*, 37, 2037, (2019).
12. **Kholghy, M.R.**, Kelesidis, G.A. and Pratsinis, S.E., “Reactive polycyclic aromatic hydrocarbon dimerization drives soot nucleation”, *Physical Chemistry Chemical Physics*, 20, 10926, (2018).
11. **Kholghy, M.R.**, Weingarten, J., Sediako, A., Barba, J., Lapuerta, M., Thomson, M.J., “Structural effects of biodiesel on soot formation in a laminar coflow diffusion flame”, *Proceedings of the Combustion Institute*, 36, 1321 (2017).

10. **Kholghy, M.R.**, Afarin, Y., Barba, J., Lapuerta, M., Sediako, A., Thomson, M.J., “Comparison of multiple diagnostic techniques to study soot formation and morphology in a diffusion flame”, *Combustion and Flame*, 176, 567 (2017).
9. Lapuerta, M., Barba, J., Sediako, A., **Kholghy, M.R.**, Thomson, M.J., “Morphological analysis of soot agglomerates from biodiesel surrogates in a coflow burner”, *Journal of Aerosol Science*, 11, 65 (2017).
8. Sediako, A., Soong, C., Howe, J., **Kholghy, M.R.**, Thomson, M.J., “In situ observation of soot oxidation with an environmental transmission electron microscope”, *Proceedings of the Combustion Institute*, 36, 841 (2017). (*distinguished paper*)
7. **Kholghy, M.R.**, Veshkini, A., Thomson, M.J., “The core-shell internal nanostructure of soot, a criterion to model soot maturity”, *Carbon*, 100, 508 (2016).
6. **Kholghy, M.R.**, Weingarten, J., Thomson, M.J., “A study of the effects of the ester moiety on soot formation in a laminar coflow diffusion flame of a surrogate for B100 biodiesel”, *Proceedings of the Combustion Institute*, 35, 905 (2015).
5. Cain, J., Laskin, A., **Kholghy, M.R.**, Thomson, M.J., Wang, H., “Molecular characterization of organic content of soot along the centerline of the coflow diffusion flame”, *Physical Chemistry Chemical Physics*, 16, 25862 (2014).
4. Saffaripour, M., Veshkini, A., **Kholghy, M.R.**, Thomson, M.J., “Experimental investigation and detailed modeling of soot aggregate formation and size distribution in laminar coflow diffusion flames of jet A-1, a synthetic kerosene, and n-decane”, *Combustion and Flame*, 161, 848 (2014).
3. **Kholghy, M.R.**, Saffaripour, M., Yip, C., Thomson, M.J., “The evolution of soot morphology on the centerline of a laminar coflow diffusion flame of a surrogate for Jet A-1”, *Combustion and Flame*, 160, 2119 (2013).
2. Saffaripour, M., **Kholghy, M.R.**, Dworkin, S.B., Thomson, M.J., “A numerical and experimental study of soot formation in a laminar coflow diffusion flame of a Jet A-1 surrogate”, *Proceedings of the Combustion Institute*, 34, 1057, (2013).
1. Saffaripour, M., Zabeti, P., **Kholghy, M.R.**, Thomson, M.J., “An experimental comparison of the sooting behavior of synthetic Jet fuels”, *Energy and Fuels*, 25, 5584, (2011).

V. Research Grants, 1'053'500 CAD in total as PI.

5. “Flame Made Nanoparticles”, Canada Research Chair (Tier II), 2019-2024, \$600'000.
4. “Energy Storage by Plasma Methane Decarbonization for CO₂-free Synthesis of H₂ and Carbonaceous Nanoparticles”, NSERC Discovery Grant, 2019-2024, \$135'000.
3. “Energy Storage by Plasma Methane Decarbonization for CO₂-free Synthesis of H₂ and Carbonaceous Nanoparticles”, NSERC Discovery Grant-Early Career Supplemental Award, 2019-2023, \$12'500.
2. “Multiscale Modeling of Carbonaceous Nanoparticle Formation in Flames”, NSERC Postdoctoral Fellowship, 05/2017-04/2019, \$90'000.
1. “Experimental and numerical study of the evolution of soot morphology and chemical composition in laminar, co-flow, diffusion flames of the surrogates for jet fuels”, NSERC Vanier PhD fellowship, 09/2013-08/2016, \$150'000.

VI. Editorial Activates

1. *Guest editor* for special issue in *processes* on “Gas-Phase Manufacturing of Nanoparticles: Synthesis and Multiscale Modelling”
2. *Reviewer for*:
 - International Journal of Chemical Kinetics (1)
 - Proceedings of the Combustion Institute (7)
 - Aerosol Science and Technology (1)
 - Journal of Aerosol Science (1)
 - Combustion and Flame (4)
 - Physical Chemistry C (1)
 - Ceramic International (1)
 - HERM 2018 (2)
 - Fuel (1)

VII. Teaching

6. Applied Thermodynamics, (BSc), W 2020, Carleton
5. Fluid Mechanics, (BSc), W 2020, Carleton
4. Micro and Nanoparticle Engineering, (BSc), W 2019, ETH
3. Mass Transfer, (BSc), Lecturer, F 2018, ETH
2. Fundamentals of Combustion (PhD and MSc), W 2017, University of Toronto
1. Fundamentals of Computer Programming (BSc), W 2016, University of Toronto

VIII. Supervision of Students

14. Valentina DeRosa, Master Semester Project, ETH, 2019, “Spray synthesis of carbon nanoparticles”. Currently a master student in ETH.
13. Alexander Schumann, BSc thesis, ETH, 2019, “Process design for gas phase synthesis of Nickel nanoparticles”. Currently a bachelor student in ETH.
12. Raphael Floader, BSc thesis, ETH, 2019, “Developing an automated tool for measuring nanoparticle optical band gap”. Currently an intern in Siemens.
11. Stephan Wendelspiess, BSc thesis, ETH, 2019, “Developing a two-dimensional moving sectional model to simulate nanoparticle synthesis during simultaneous nucleation, surface growth, sintering and coagulation”, Currently a master student in ETH.
10. Ewald Kleefstra, BSc thesis, ETH, 2019, “An open source code for simulating gas phase synthesis of nanoparticles with laminar flames”. Currently IT developer in Gyselroth.
9. Stephan Wendelspiess, Course Mini Project, ETH, 2018, “A monodisperse model for highly-concentrated aerosols”. Currently a master student in ETH.
8. Armen Zendeli, MSc project, ETH, 2018, “A monodisperse Population Balance Model Accounting for Particle Morphology and Polydispersity”. Currently a MASc student in ETH.
7. Sammuell Beggs, BSc, student in University of Toronto, 2016, “Design and 3D printing of a particulate filter using centrifugal and electrostatic precipitation”.

6. Anton Sediako, MSc student in University of Toronto, transferred to PhD, 2014/17, “Using analytical Environmental Electron Microscopy to study soot oxidation”. Currently a research and consulting engineering in Semcon.
5. Ali Naseri, MSc student in University of Toronto, transferred to PhD, 2014/17, “Numerical model development for soot formation in flames”. Currently a PhD student in U of T.
4. Jason Weingarten, MSc student in University of Toronto, 2013-2015, “Effects of biodiesel chemistry on soot formation”. Currently a Project Manager at Litens Automative Group, Toronto.
3. Sebastian Thion, MSc exchange student from University of Orleans, 2012, “Measuring soot formation in jet fuel surrogates”. Currently a Research Engineer at EDF, France
2. Justin F. Thomson, summer student in University of Toronto, 2011, “Designing a vapor condensation column”. Currently an Engineering Assistant Metallurgist at Essar Steel Algoma, Toronto.
1. Spencer Sleep, summer student in University of Toronto, 2011, “Automation of laser light extinction measurements”.

IX. Community service:

Program leader for the International Sooting Flame Workshop, 2019-now.

Session chair for the 37th international symposium on Combustion, August 2018, Dublin.

Jury members for MaP symposium, ETH Zurich, June 2018.

X. Membership:

Combustion Institute