

Ing. Alessandro Stagni

Assistant Professor (RTDa)

CRECK Modeling - Politecnico di Milano

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Work Experience

- 2017 – Present Assistant Professor (RTDa)
Lecturer of “Fundamentals of Chemical Plants” (Energy Engineering)
Politecnico di Milano. Milano, Italy.
- 2016 – 2017 Post-doctoral Researcher
Modeling of the evaporation and combustion of bio-oil droplets derived from the fast
pyrolysis of biomasses
Politecnico di Milano. Milano, Italy.
- 2011 Sept-Dec MSc Internship as R&D process engineer.
Procter and Gamble. Brussels, Belgium
- 2009 Mar-Jul BSc Internship as process engineer.
Topic: Modeling of an IGCC plant using dedicated software (ProMax).
Foster Wheeler Italiana. Milano, Italy

Education

- 2012 – 2016 Doctor of Philosophy (Ph.D.) in Industrial Chemistry and Chemical Engineering.
Defense of Thesis work “Implementation of detailed chemistry in large-scale combustion
computations”. Advisor: prof. T. Faravelli.
Score: Ph.D. *summa cum Laude.*
Politecnico di Milano. Milano, Italy.
- 2015 Feb-Nov Visiting Ph.D. Student at Center for Turbulence Research.
Sponsor: prof. M. Ihme.
Stanford University. Stanford (CA), United States.
- 2009 – 2011 Master of Science in Chemical Engineering.
Defense of Thesis work “Numerical methods of parallel computation for the solution of
reactor networks”. Advisor: prof. T. Faravelli.
Score: 110/110 *cum Laude.*
Politecnico di Milano. Milano, Italy.
- 2009 – 2011 Alta Scuola Politecnica: Double MSc program in Chemical Engineering.
REPACK Project: Sustainable packaging for fast moving consumer goods, sponsored by
Procter & Gamble.
Degree award with merit.
Politecnico di Milano - Politecnico di Torino, Italy.
- 2006 – 2009 Bachelor of Science in Chemical Engineering
Defense of Thesis work “Modeling of an IGCC plant”. Advisor: prof. T. Faravelli.
Score: 110/110 *cum Laude.*
Politecnico di Milano. Milano, Italy.

2001 – 2006 High school program (Liceo Scientifico)
Score: 100/100.
Liceo Scientifico Statale “C. Cafiero”. Barletta, Italy.

Peer-reviewed publications

1. **Stagni, A.**, Brignoli D., Cinquanta M., Cuoci A., Frassoldati A., Ranzi E., & Faravelli T.. (2017). *The influence of low-temperature chemistry on partially-premixed counterflow n-heptane/air flames*. Combustion and Flame, *in press*.
2. Lucchini, T., D’Errico, G., Onorati, A., Frassoldati, A., **Stagni, A.**, & Hardy, G. (2017). *Modeling Non-Premixed Combustion Using Tabulated Kinetics and Different Flame Structure Assumptions*. SAE International Journal of Engines, 10(2017-01-0556), 593-607.
3. Carrera, A., Pelucchi, M., **Stagni, A.**, Beretta, A., & Groppi, G. (2017). *Catalytic partial oxidation of n-octane and iso-octane: Experimental and modeling results*. International Journal of Hydrogen Energy, 42(39), 24675-24688.
4. **Stagni, A.**, Esclapez, L., Govindaraju, P., Cuoci, A., Faravelli, T., & Ihme, M. (2016). *The role of preferential evaporation on the ignition of multicomponent fuels in a homogeneous spray/air mixture*. Proceedings of the Combustion Institute, 36(2), 2483-2491.
5. Evans, M.J., Medwell, P.R., Wu, H., **Stagni, A.**, & Ihme, M. (2016). *Classification and Lift-Off height prediction of non-premixed MILD and autoignitive flames*. Proceedings of the Combustion Institute, 36(3), 4297-4304.
6. Franzelli, B., Cuoci, A., **Stagni, A.**, Ihme, M., Faravelli, T., & Candel, S. (2016). *Numerical investigation of soot-flame-vortex interactions*. Proceedings of the Combustion Institute, 36(1), 753-761.
7. Mairinger, G., Frassoldati, A., Gehmlich, R., **Stagni, A.**, Ranzi, E., Seshadri, K. (2016). *Autoignition of Condensed Hydrocarbon Fuels in Nonpremixed Flows at Elevated Pressures*. Combustion Theory and Modeling, 20 (6), 995-1009
8. Frassoldati, A., Cuoci, A., **Stagni, A.**, Faravelli, T., & Ranzi, E. (2016). *Skeletal kinetic mechanism for Diesel combustion*. Combustion Theory and Modeling, *in press*.
9. Evans, M.J., Medwell, P.R., Tian, Z., Frassoldati, A., Cuoci, A., & **Stagni, A.** (2016). *Ignition Characteristics in Spatially Zero-, One- and Two- Dimensional Laminar Ethylene Flames*. AIAA Journal, 54(10), 3255-3264.
10. Bernardi, M.S., Pelucchi, M., **Stagni, A.**, Sangalli, L.M., Cuoci, A., Frassoldati, A., Secchi, P., & Faravelli, T. (2016). *Curve Matching, a generalized framework for models/experiments comparison: an application to n-heptane combustion kinetic mechanisms*. Combustion and Flame, 168, 186-203.
11. **Stagni, A.**, Frassoldati, A., Cuoci, A., Faravelli, T., & Ranzi, E. (2016). *Skeletal mechanism reduction through species-targeted sensitivity analysis*. Combustion and Flame, 163, 382-393.
12. Frassoldati, A., D’Errico, G., Lucchini, T., **Stagni, A.**, Cuoci, A., Faravelli, T., Onorati, A. & Ranzi, E. (2015). *Reduced kinetic mechanisms of diesel fuel surrogate for engine CFD simulations*. Combustion and Flame, 162(10), 3991-4007.
13. Pelucchi, M., Bissoli, M., Cavallotti, C., Cuoci, A., Faravelli, T., Frassoldati, A., Ranzi, E. & **Stagni, A.** (2014). *Improved Kinetic Model of the Low-Temperature Oxidation of n-Heptane*. Energy & Fuels, 28(11), 7178-7193.
14. Ranzi, E., Frassoldati, A., **Stagni, A.**, Pelucchi, M., Cuoci, A., & Faravelli, T. (2014). *Reduced Kinetic Schemes of Complex Reaction Systems: Fossil and Biomass-Derived Transportation Fuels*. International Journal of Chemical Kinetics, 46(9), 512-542.

15. **Stagni, A.**, Saggese, C., Bissoli, M., Cuoci, A., Frassoldati, A., Faravelli, T., & Ranzi, E. (2014) *Reduced Kinetic Model of Biodiesel Fuel Combustion*, Chemical Engineering Transactions 37 (877-882).
16. **Stagni, A.**, Cuoci, A., Frassoldati, A., Faravelli, T., & Ranzi, E. (2013). *Lumping and reduction of detailed kinetic schemes: an effective coupling*. Industrial & Engineering Chemistry Research, 53(22), 9004-9016.
17. **Stagni, A.**, Cuoci, A., Frassoldati, A., Faravelli, T., & Ranzi, E. (2014). *A fully coupled, parallel approach for the post-processing of CFD data through reactor network analysis*. Computers & Chemical Engineering, 60, 197-212.
18. Cuoci, A., Frassoldati, A., **Stagni, A.**, Faravelli, T., Ranzi, E., & Buzzi-Ferraris, G. (2013). *Numerical modeling of NO_x formation in turbulent flames using a kinetic post-processing technique*. Energy & Fuels, 27(2), 1104-1122.

Conferences

1. **Stagni, A.**, Bernardi, M.S., Pelucchi, M., Sangalli, L.M., Cuoci, A., Frassoldati, A., Secchi, P., Faravelli, T., *Curve Matching: a generalized framework for model comparison with large sets of experiments*, Workshop of the WG4 SMARTCATs COST Action, April 5-6, 2016, Naples, Italy.
2. **Stagni, A.**, Frassoldati, A., Cuoci, A., Faravelli, T., & Ranzi, E. *Kinetic modeling of soot formation from n-heptane combustion*, Kaust Future Fuels Workshop, March 7-9, 2016, Thuwal, Saudi Arabia.
3. Evans, M. J., Medwell, P. R., Wu, H., **Stagni, A.**, Ihme, M., *Classification of non-premixed MILD and autoignitive flames*, Australian Combustion Symposium, December 7-9, 2015, Melbourne, Australia.
4. Govindaraju, P., **Stagni, A.**, & Ihme, M., *Evaporation and combustion characteristics of multicomponent fuels*. 68th Annual Meeting of the APS Division of Fluid Dynamics, November 22-24, 2015, Boston (MA), United States.
5. Pelucchi, M., **Stagni, A.**, Bissoli, M., Cuoci, A., Frassoldati, A., Ranzi, E., Faravelli, T., *Detailed kinetic mechanisms for practical applications: new reaction classes and model reduction*. CleanAir 2015, July 5-9, 2015, Lisbon, Portugal.
6. Evans, M. J., Medwell, P. R., Tian, Z. F., Frassoldati, A., Cuoci, A., & **Stagni, A.** *Ignition Characteristics in Spatially Zero-, One- and Two- Dimensional Laminar Ethylene Flames*. 22nd AIAA Computational Fluid Dynamics Conference, June 22-26, 2015, Dallas (TX), United States.
7. Frassoldati, A., Cuoci, A., **Stagni, A.**, Faravelli, T., Ranzi, E., *Skeletal kinetic mechanism for Diesel combustion*, 9th Mediterranean Combustion Symposium, June 7-11, 2015, Rhodes, Greece.
8. Franzelli, B., Cuoci, A., **Stagni, A.**, Saggese, C., Frassoldati, A., Faravelli, T. & Ihme, M., *Accounting for strain-rate effect in soot modeling of turbulent flames*, 15th International Conference on Numerical Combustion, April 19-22, 2015, Avignon, France.
9. **Stagni, A.**, Saggese, C., Bissoli, M., Cuoci, A., Frassoldati, A., Faravelli, T., & Ranzi, E. *Reduced Kinetic Model of Biodiesel Fuel Combustion*, International Conference on BioMass, May 4-7, 2014, Florence, Italy.
10. D'Errico, G., Lucchini, T., **Stagni, A.**, Frassoldati, A., Faravelli, T., & Ranzi, E.. *Reduced kinetic mechanisms for diesel spray combustion simulations*. 11th International Conference on Engines & Vehicles, September 15-19, 2013, Capri (NA), Italy.
11. **Stagni, A.**, Cuoci, A., Frassoldati, A., Faravelli, T., & Ranzi, E. *A Fully Coupled Approach for Predicting Pollutants Formation Through Reactor Network Analysis*, 14th International Conference on Numerical Combustion, April 8-10, 2013, San Antonio (TX), United States.