Alessio Frassoldati

Full Professor

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Education, Career, & Awards

1999: M.Sci., Politecnico di Milano

2003: Visiting Scholar, UCSD – San Diego (USA).

2004: Ph.D., Politecnico di Milano

2006: Research activity at LEAP-Politecnico Milano

2007: Assistant Professor at Politecnico di Milano

2015: Associate Professor at Politecnico di Milano

2016: Coordinator of the PhD program in *Industrial Chemistry and Chemical Engineering* (CII)

2019: Full Professor at Politecnico di Milano

Research group web page

http://www.chem.polimi.it/creckmodeling/

Current Research Interests

- Detailed kinetics of combustion and formation of pollutants (NOx, PAH, soot);
- H_2 combustion
- Flammability limits using detailed kinetics
- Detailed kinetics of biofuels
- Combustion in internal combustion engines
- Numerical modeling of solid fuels (biomass & plastic waste) pyrolysis and gasification.
- CFD modeling of turbulent combustion
- Multicomponent droplet combustion
- Tunnel fire safety

PROFESSIONAL AFFILIATION

Dr. Alessio Frassoldati is currently a professor at the Department of Chemistry, Materials and Chemical Engineering of Politecnico di Milano. He got a degree in Chemical Engineering cum laude in 1999 and a PhD degree in Chemical Engineering in 2004 at Politecnico di Milano.

Member of the Italian Section of the Combustion Institute since 2001.

Member of the Board of the **Italian Section of the Combustion Institute** from 2011 to 2015.

POST-DOC ACTIVITY

2004-2006. Research activity at Politecnico di Milano (Dip. Chimica Materiali e Ing. Chimica and Centro per lo Sviluppo del Polo di Piacenza).

PhD ACTIVITY

2004. PhD in Chemical Engineering at Politecnico di Milano. Title of the thesis: “NOx formation in turbulent diffusion flames: kinetics and fluid dynamics analysis”.

2003. Research on NOx formation in flames at the Center for Energy Research (CER) - University of California, San Diego.

TEACHING ACTIVITY

Teaching activities for students in energetic and chemical engineering (combustion, unit operations, probability and error analysis). Teaching activity in the PhD courses on Chemical kinetics and Fluidynamics. Supervisor of more than 20 theses in energy and chemical engineering at Politecnico di Milano. Teacher at the “Training school on Modeling Combustion Kinetics” for PhD students of the EU-COST Action CM0901.

SERVICE AND AWARDS

2016÷2021. Coordinator of the PhD program in Industrial Chemistry and Chemical Engineering.

2020 Receiver of the 2020 *Research Excellence Award* of the Combustion Institute.

2019. Cover of Reaction Chemistry & Engineering (3) 2019 for the paper "Detailed kinetics of substituted phenolic species in pyrolysis bio-oils".

2018. co-chair of the WIPPs Session of the 37th International Combustion Symposium (2018) 2014-2016-2018 member for the Silver Medal Committee and for the Bernard Lewis Fellowship Committee of the International Combustion Institute.

2013. Invited speaker at the "The International Workshop on Frontiers of Combustion Chemistry" organized by the National Synchrotron Radiation Laboratory of the University of Science and Technology of China.

2012. Sugden Award 2012, awarded by the from British Section of the Combustion Institute, for the paper: G. Dixon-Lewis, P. Marshall, B. Ruscic, A. Burcat, E. Goos, A. Cuoci, A. Frassoldati, T. Faravelli, P. Glarborg "Inhibition of hydrogen oxidation by HBr and Br2", Combustion and Flame, vol. 159 pp. 528-540

2010. "Feature Article" in the Combustion and Flame edition of number 157.

RESEARCH ACTIVITY

The current research activity is focused on the following topics:

- Detailed kinetics of combustion and formation of pollutant species (NOx, PAH, soot);
- Formation of pollutant species (nitrogen oxides, poly-cyclic aromatic hydrocarbons and soot) in laboratory-scale burners, in industrial furnaces and combustors for gas turbines.
- CFD and kinetic modeling of flameless (MILD) combustion and Oxy-fuel combustion.
- CFD modeling of furnaces and industrial burners.
- Pollutant formation combustion in internal combustion engines (SI, Diesel and HCCI)
- Numerical modeling of solid fuels (biomass & plastic waste) pyrolysis and gasification.
- Detailed kinetics of real fuels combustion (gasoline, diesel and jet fuels) and biofuels.
- Detailed kinetics of H_2 combustion and its mixtures with hydrocarbons and oxygenated compounds.
- Evaluation of flammability limits of pure components and mixtures using detailed kinetics
- Multicomponent droplet evaporation and combustion
- Tunnel fire safety.

The research activity is supported by several cooperation agreements with national and international institutions and companies.

Moreover, several researches are performed in cooperation with Italian and international research centers and Universities. The scientific production includes more than 200 papers on international journals and more than 120 contributions in conference proceedings.

Scopus database: 10,000 total citations, H-index=55 (February 2024)

Patents: Flameless boiler for producing hot water. Patent n° EP 2592362A1.