



Fabrice Lemoine

Professor

Email: [fabrice.lemoine@univ-lorraine.fr](mailto:fabrice.lemoine@univ-lorraine.fr)



## Research

LEMMA - Université de Lorraine - CNRS - UMR 7563

2 avenue de la forêt de Haye, BP 160, 54504 Vandoeuvre-lès-Nancy, FRANCE

### Current Research Interests

- Optical diagnostics in droplets and sprays (temperature, size, composition measurement)
- Droplet and spray combustion
- Droplet/wall interaction

## Teaching

Ecole Nationale Supérieure d'Electricité et de Mécanique (ENSEM)

2 avenue de la forêt de Haye, BP 160, 54516 Vandoeuvre-lès-Nancy, FRANCE.

### Main teaching topics

- Combustion (3<sup>rd</sup> year Engineer School and MASTER MEPP)
- Optical measurement techniques in fluid flows (3<sup>rd</sup> year Engineer School and MASTER MEPP)
- Compressible flows (2<sup>nd</sup> year Engineer School)

Director of the one year training course about 'Energy' in ENSEM.

## Career

### - Initial training

**1991-1993** PhD from University Pierre et Marie Curie (Paris 6) prepared in ONERA (Palaiseau) and Institute of Fluid Mechanics (Lille)

"Application of iodine laser-induced fluorescence to pressure measurement ; extension to the principles of velocity measurement"

**1990-1991** Master of Science in "Energy Conversion" (University Pierre et Marie Curie, Paris 6, Paris)

**1990** Engineer Diploma of ESTACA (Superior School of Aeronautics and Automobile, Paris).

### - Main career elements

**1994-1996** Assistant Professor in "Institut Universitaire de Technologie" (Nancy), Department of Mechanical Engineering. Research activities in LEMTA Laboratory

**1996** Associate Professor in School of Mechanical and Electrical Engineering (ENSEM). Research activities in LEMTA Laboratory.

**2002** "Habilitation à diriger des Recherches" on the topic « Development of optical techniques in fluid mechanics».

**Since 2004** Full Professor of Fluid Mechanics in School of Mechanical and Electrical Engineering (ENSEM). Research activities in LEMTA Laboratory.

### Main current responsibilities

- **Since 2009** Director of LEMTA : Laboratory of Energetics, Theoretical and Applied Mechanics (University of Lorraine, CNRS, UMR 7563) : 80 researchers, 24 engineers, technicians and administrative staff, 10 post-doc, 57 PhD students.
- **Since 2010** Member of the governing board of the French Alliance for Energy Research (ANCRE). Deputy of the French Conference of University Rectors.
- **Since 2010** French delegate of the Conference of University Rectors in the European Energy Research Alliance (EERA) : <http://www.eera-set.eu/>.

## Scientific and professional societies membership

- Member of the administration board of the French Association for Laser Techniques (AFVL) : [www.afvl.ensma.fr/](http://www.afvl.ensma.fr/)
- Member of AFM (French Association of Mechanics)

## International scientific board membership

- Referee for the « International Symposium on Combustion », Varsaw, Poland, August 2012.
- Member of the scientific committee of the « International conference on Liquid Atomization and Spray Systems», ILASS Europe, Estoril, Portugal, 2011.
- Member of the scientific committee of the « International Symposium on Laser Diagnostics in Fluid Mechanics», Lisbon, Portugal, 2012
- Member of the scientific committee of the « International Conference on Liquid Atomization and Spray Systems », ICLASS 2012, Heidelberg, Germany, 2012.

## International cooperation

- University of Brighton (Sir Harry Ricardo Laboratories), United Kingdom
- Technical University, Darmstadt, Center for Smart Interfaces (CSI), Germany

## Recent invited lectures or seminar

- French Congress of Mechanics (Besançon, 2011), 31 August 2011  
« Transferts de chaleur dans des gouttelettes de combustible en milieu réactif »
- Technical University Stuttgart, Germany (Institut für Thermodynamik der Luft- und Raumfahrt), 11 March 2011, Invited seminar : « Heat and mass transfer in evaporating and reacting sprays ».

## Recent archival journal publications

1. V. Deprédurand, P. Miron, A. Labergue, M. Wolff, and F. Lemoine, "A temperature sensitive tracer suitable for two colour laser induced fluorescence applied to evaporating droplet temperature measurement", *Measurement Science & Technology*, vol. 19, 2008.
2. C. Maqua, G. Castanet, F. Grisch, F. Lemoine, T. Kristyadi, and S. Sazhin, "Monodisperse droplets heating and evaporation : experimental study and modelling", *International Journal of Heat and Mass Transfer*, vol. 51, pp. 3932-3945, 2008.
3. C. Maqua, G. Castanet, and F. Lemoine, "Bicomponent droplets evaporation : Temperature measurements and modelling", *Fuel*, vol. 87, pp. 2932-2942, 2008.
4. T. Liénart, G. Castanet, and F. Lemoine, "Heating of droplets impacting onto a heated wall", *International Journal of Heat and Mass Transfer*, vol. 52, pp. 670-679, 2009.

5. V. Deprédurand, G. Castanet, and F. Lemoine, "Heat and mass transfer in evaporating droplets in interaction : Influence of the fuel", *International Journal of Heat and Mass Transfer*, vol. 53, Issues 17-18, pp. 3495-3502, 2010.
6. A. Labergue, V. Deprédurand, A. Delconte, G. Castanet, and F. Lemoine, "New insight into two-color LIF thermometry applied to temperature measurements of droplets", *Experiments in Fluids*, vol. 49, Issue 2, pp. 547-556, 2010.
7. S.S. Sazhin, A. Elwardany, P.A. Krutitskii, G. Castanet, F. Lemoine, E.M. Sazhina, and M.R. Heikal, "A simplified model for bi-component droplet heating and evaporation", *International Journal of Heat and Mass Transfer*, vol. 53, Issue 21-22, pp. 4495-4505, 2010.
8. T. Kristyadi, V. Deprédurand, G. Castanet., F. Lemoine, S.S. Sazhin, A. Elwardany, E.M. Sazhina, M.R. Heikal "Monodisperse monocomponent fuel droplet heating and evaporation", *Fuel* 89 (12), pp. 3995-4001, 2010.
9. V. Deprédurand, A. Delconte, and F. Lemoine, "Combined PDA and LIF applied to size-temperature correlations measurements in a heated spray", *Experiments in Fluids*, vol. 50 (3), pp. 561-571, 2011.
10. G. Castanet, A. Labergue, and F. Lemoine, "Internal temperature distributions of interacting and vaporizing droplets", *International Journal of Thermal Science*, vol. 50, Issue 7, pp. 1181-1190, 2011.
11. P. Dunand, G. Castanet, and F. Lemoine, "A two-color planar LIF technique to map the temperature of droplets impinging onto a heated wall", *Experiments in Fluids*, (Accepted, available online, DOI: 10.1007/s00348-011-1131-1), 2011.
12. S.S. Sazhin, A.E. Elwardany, P.A. Krutiskii, V. Deprédurand, G. Castanet, F. Lemoine, E.M. Sazhina, and M.R. Heikal, "Multi-Component droplet heating and evaporation: numerical simulation versus experimental data", *International Journal of Thermal Sciences*, vol. 50, Issue 7, pp. 1164-1180, 2011.
13. G. Castanet, B. Frackowiak, C. Tropea, and F. Lemoine, "Heat convection within evaporating droplets in strong aerodynamic interactions", *International Journal of Heat and Mass Transfer*, vol. 54, Issues 15-16, pp. 3267-3276, 2011.
14. A. Labergue, A. Delconte, G. Castanet, and F. Lemoine, "Study of the droplet size effect coupled with the laser light scattering in sprays for two-color LIF Thermometry measurements", *Experiments in Fluids*, Accepted, December 2011 (available online first, DOI: 10.1007/s00348-011-1242-8).