



# RainbowVision

Master your spray

## Table of content

- *RainbowVision*
- The founder
- The Principle
- The device
- The company
- Applications

## Inaccessible Measurement

Sprays are world widely used in industrial applications. The spray characterization is crucial for improving the production efficiency. However, the spray measurements are limited to geometrical properties as droplet size, shape, velocity, etc. *RainbowVision* is the unique company to propose powerful devices to measure the thermo-physical properties of the spray. These key parameters are essential to control the energy efficiency and product quality in numerous industrial processes. Measuring simultaneously the aver-

age droplet temperature and size distribution, the new developed device can be easily applied in the laboratories and industrial scale.

*RainbowVision* offers innovative optical instruments permitting precise measurement with appealing features as compact size, rapid response and short measurement times. The technique is based on the analysis of the scattered light around rainbow angle called Global Rainbow Technique (GRT).

## Founders

*RainbowVisions* has been established by two researchers world-wide recognize in the field of particle optical diagnostic.

Dr. Sawitree SAENGKAEW, HDR (Habilitation à Diriger les Recherches: Habilitation to supervise research) is specialist in light scattering diagnostics of the spray. She has been working on the optical measurement of the droplets temperature for fifteen years. Presently, Dr. Sawitree Saengkaew manages

*RainbowVision* to give a new and original emphasis to her scientific work.

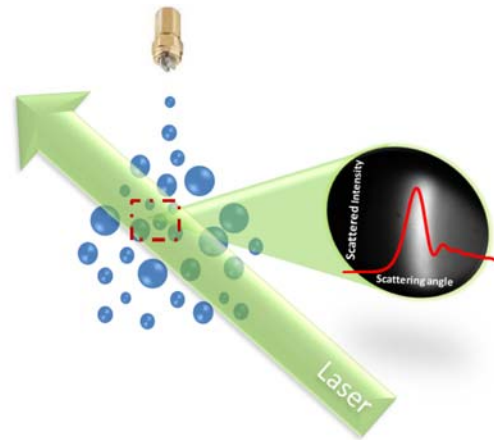
Dr. Gerard GRÉHAN was Director of Research (DR1) at CNRS (French Centre for Scientific Research). He is internationally well known as an expert in theoretical light scattering by particles.

The ambition of the company is to become a leader in the field of thermo-chemical characterization of sprays.



## Global Rainbow Technique Principle

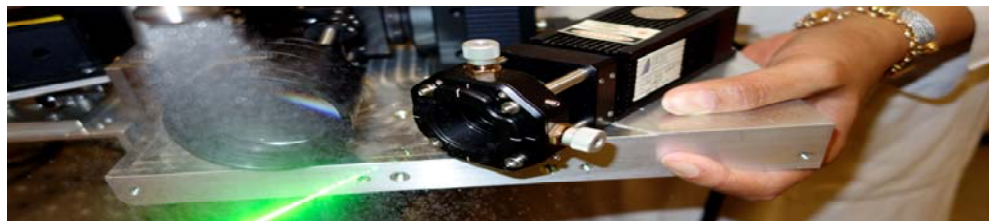
Rainbow refractometry records the light diffused in the vicinity of the rainbow angle. The refractive index is extracted from the position of the rainbow, while the shape of the rainbow gives access to size and distribution.



Global Rainbow Signal

## GRT devices

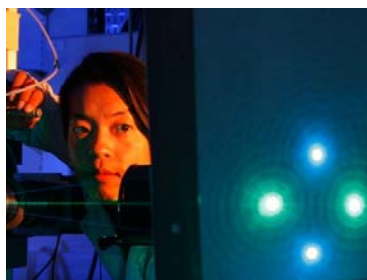
The *Rainbow Vision* devices are compact and ready for use. They are user friendly thanks to software which enables an intelligent processing of the recorded images.



## The company



*Rainbow Vision* is a young start-up company dedicated to the metrology of spray properties. Originally, the founders worked at the Department of Optics at UMR CNRS 6614//CORIA. Nowadays, Rainbow Vision is the partner in H2020 (Ice-Genesis project). The company develops a strong expertise in icing wind tunnel characterization with different partners as Airbus, Safran Aerosafety, DGA, RTA etc.,



## Applications

The knowledge of the temperature and the composition are two crucial parameters in understanding and controlling the reactive sprays. **RainbowVision** technology is particularly well adapted to the study of:

- Icing in wind tunnel
- Liquid combustion as for car engines, plane engines and rockets engine
- Spray dryers for powder food as well as cosmetics and pharmaceutical sprays
- Heterogeneous Chemistry as gaseous CO<sub>2</sub> capture by MEA spray

The technology has been successfully used in several fields, for example:



### Liquid Combustion

*Experimental study of local flame structures and fuel droplet properties of a spray jet flame,*

A. Verdier, J. Marrero Santiago, A. Vandel, S. Saengkaew, G. Cabot, G. Grehan, B. Renou, Proceedings of the Combustion Institute, <http://dx.doi.org/10.1016/j.proci.2016.07.016>

*Multicomponent fuel droplet evaporation using 1D Global Rainbow*

*Technique,* J.Promvongsa, P.Vallikul, B.Fungtammasan, A. Garo, G. Grehan, S.Saengkaew, Proceedings of the Combustion Institute, <http://dx.doi.org/10.1016/j.proci.2016.08.010>

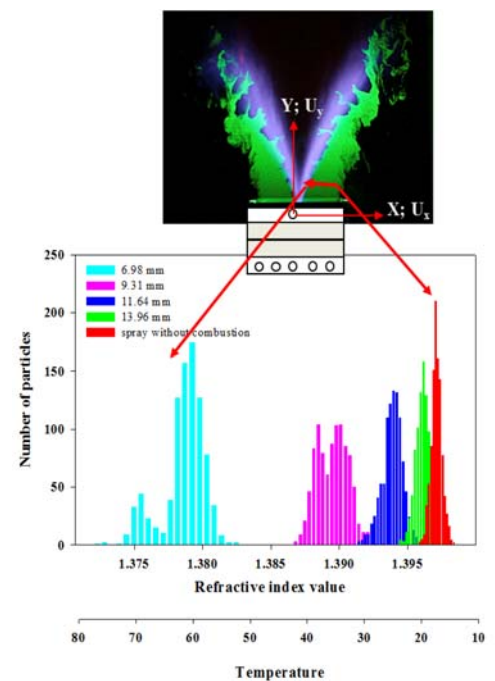
### Flash Evaporation

*Temperature and droplet size measurements in a flashing ethanol jet using the global rainbow thermometry,*

H. Kamoun, G. Lamanna, B. Weigand, S. Saengkaew, G. Grehan and J. Steelant, 25<sup>th</sup> ILASS – Europe 2013, Chania Crete, 1-4 September 2013

### CO<sub>2</sub> Capture

*Local Measurement of mass transfer in a reactive spray for CO<sub>2</sub> capture,* M. Ouboukhil, S. Saengkaew, M.C. Fournier-Salaün, L. Estel et G. Grehan, The Canadian Journal of Chemical Engineering, 2015, Vol 93, Issue2, 419-426



**RainbowVision SAS**  
30 Rue Eau de Robec  
76 000 Rouen

Web : [www.rainbow-visions.com](http://www.rainbow-visions.com)  
E-mail : [s.sawitree76@rainbow-visions.com](mailto:s.sawitree76@rainbow-visions.com)  
Tel: +33 6 79 43 97 76



*RainbowVision is a start-up company whose ambition is to transform the innovative concepts and ideas into performant instruments.*

*Its products have been developed in response to the demands of research laboratories as well as to provide a way of measuring complex processes on automated industrial production lines.*

**RainbowVision** offers you:

- ◆ Sale the equipment
- ◆ Measurement campaign
- ◆ Collaborative research projects

*For more information: [s.sawitree76@rainbow-visions.com](mailto:s.sawitree76@rainbow-visions.com)*

