



ILASS-Europe Newsletter

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ILASS – Europe Committee: New Officers & Committee Members

The election of new officers of the ILASS-Europe Committee was approved in the last AGM Meeting held during ILASS 2017 in Valencia.

Here is the updated composition of ILASS – Europe Committee, which can also be seen at [our website](#).

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Paul Eisenklam Travel and Research Awards for Young Researchers from Europe

ILASS-Europe supports up to 4 young researchers each year to attend ICLASS and ILASS-Europe conferences through the Paul Eisenklam Travel and Research Award. The award in the form of a bursary has a maximum amount of 1500 €, including travel expenses, accommodation, daily allowances and conference fees.

Eligible candidates must meet the following criteria:

1. Be a full time graduate student/research assistant at a European research facility at the time of the
-

conference.

2. Present a poster or an oral paper at the conference, describing the research effort to which he/she made a significant contribution.
3. Clearly benefit from the availability of travel funds in order to attend the conference.

To apply for funding, applicants must submit the following information, together with the conference abstract:

- A brief description of the research to be presented
- A statement, why it is essential to receive the travel award to be able to join the conference
- An affirmation of willingness to present a paper or a poster on the conference
- Details of other awards, contributions or grants towards travel and/or subsistence expenses for the same conference
- Explanation of the expected benefit from conference attendance.

Also, a letter of endorsement of the research advisor must be included.

Consideration will be given to the general contribution of the work to the field of Atomization and Sprays, the applicant's contribution to the research, financial need, and how the conference attendance will advance the applicant's career.

Expenses will be reimbursed after the conference on the basis of original documents.

Please send your complete e-mail application in a single pdf file to

Prof. Dr.-Ing. Joachim Domnick

University of Applied Sciences Esslingen

Kanalstraße 33

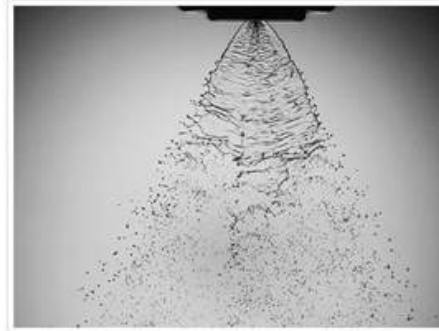
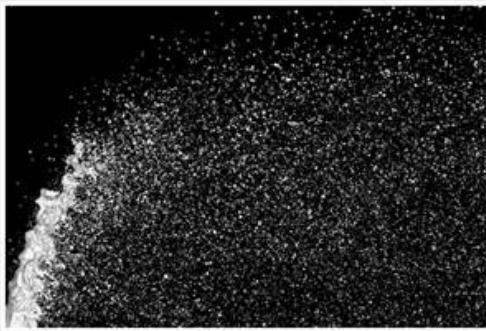
73728 Esslingen, Germany

joachim.Domnick@hs-esslingen.de

Complete information can be found in [our website](#)

The deadline to apply for the ICLASS2018 conference in Chicago, U.S., is April 1, 2018

Upcoming Events



14th International Conference on Liquid Atomization and Spray Systems

July 22-26, 2018 – Chicago, IL USA

ICLASS 2018, held at the University of Illinois at Chicago (UIC) campus will foster an environment of engagement, collaboration, and education.

Visit the ICLASS 2018 website [here](#).

Abstracts submission is closed. Full papers are due to the 2nd April 2018.

Early Bird Registration by 15th May 2018.

For now we can confirm as [KEYNOTE Speakers](#):

Dr. Günter Brenn



Dr. Günter Brenn received his Aerospace Engineering degree from the University of Stuttgart in Germany in 1985. He received his Ph.D. from the same university in 1990. His doctoral research on drop shape oscillations was supervised by Professor A. Frohn (Institute of Aerospace Thermodynamics).

After a two-year post-doctoral stay in Japan, he joined Professor F. Durst's Chair of Fluid Mechanics (LSTM) at the University of Erlangen (Germany) in 1992. Here, Dr. Brenn completed his habilitation in fluid mechanics in 1999.

In 2002, he took his present full professor position at the University of Technology in Graz, Austria. He teaches fluid mechanics, heat and mass transfer. His research interests are spray flows, the rheology and rheometry of complex liquids, heat and mass transfer in disperse systems, the stability of free-surface flows, and optical flow measuring techniques. He published more than 100 papers in scientific journals, the monograph "Analytical Solutions for Transport Processes" (Springer, 2017), and more than 130 contributions to scientific conferences. He is a member of the editorial board of the journal *Atomization and Sprays* and of the editorial advisory board of *Experiments in Fluids*.

Dr. Jiro Senda



Dr. Jiro Senda received his Bachelor's degree in Mechanical Engineering from Doshisha University (Japan) in 1978, his Master's from Doshisha University in 1980 and his Ph.D. from Doshisha University in 1985. During and after his doctoral research, Dr.

Senda took a position at Yanmar Diesel Technical Research Center and remained until 1990.

After his time at Yanmar Diesel, Dr. Senda spent the last 27 years holding various positions at Doshisha University. He started as an Assistant Professor of Mechanical Engineering and quickly moved up to Associate, then full Professor status in 1998. Prior to this, he spent one year as a visiting professor at the University of Wisconsin – Madison from 1994-95. During his time as a full professor at Doshisha University, Dr. Senda has also held varying and prestigious titles including Director of Energy Conversion Research Center, Dean of Library and Information Technology Center, and Director of Science and Engineering Research Institute.

To stay active in the scientific and industrial community, Dr. Senda actively participates in several membership committees and holds a number of professional registrations. His major research and field interests include optical measurements, fuels, spray dynamics, spray and combustion control for internal combustion engines, modeling and CFD, and sustainable urban design with optimum energy application.

Prior to this, he spent one year as a visiting professor at the University of Wisconsin – Madison from 1994-95. During his time as a full professor at Doshisha University, Dr. Senda has also held varying and prestigious titles including Director of Energy Conversion Research Center, Dean of Library and Information Technology Center, and Director of Science and Engineering Research Institute.

To stay active in the scientific and industrial community, Dr. Senda actively participates in several membership committees and holds a number of professional registrations. His major research and field interests include optical measurements, fuels, spray dynamics, spray and combustion control for internal combustion engines, modeling and CFD, and sustainable urban design with optimum energy application.

Dr. Marios Soteriou



Dr. Marios Soteriou received his Bachelor's degree in Mechanical Engineering from Imperial College in 1987, his Master's from Columbia University in 1988 and his Ph.D. from MIT in 1993.

He currently holds the Fellow of Research position at the United Technologies Research Center (UTRC) with a focus on combustion and multiphase flow. In this role, he fosters technical excellence, champions strategic opportunities, develops project content, guides technical execution, develops new capabilities, mentors staff development, and supports UTRC's operational excellence. Prior to this position, Dr. Soteriou served as Group Leader for Combustion Dynamics and Research

Engineer at UTRC. Before entering the private sector, Dr. Soteriou held an Assistant Professor position in the Department of Mechanical Engineering at the University of Connecticut and a Post-Doctoral Re-search Associate position at the Massachusetts Institute of Technology (MIT).

In his research, Dr. Soteriou employs modeling and simulation as tools to probe the physics of multiscale flows, such as reacting and multiphase flows, and exploits this understanding towards enhancing the device performance where these flows occur. His specific research interests include (i) combustion with emphasis on the dynamics of reacting flows, turbulence-combustion interactions and thermoacoustics, (ii) two-phase flows with emphasis on sprays, lubrication and cavitation, (iii) fluid mechanics with emphasis on Lagrangian transport, flow kinematics and vortex dynamics, (iv) aeroacoustics, with emphasis on low Mach number shear flow noise generation (v) buoyancy driven flows with emphasis on plumes and fires. He is the author of 34 peer-reviewed journal publications, seven patents and many conference papers, and has delivered more than 80 external technical presentations at conferences and as an invited speaker at universities.

His professional awards include the Innovation Excellence Award for Outstanding Application of High Performance Computing from the International Data Corporation, and best paper awards from the International Gas Turbine Institute of the American Society of Mechanical Engineers (ASME-IGTI) and American Helicopter Society. He is an Associate Fellow of the American Institute of Aeronautics and Astronautics (AIAA) and a member the Institute of Liquid Atomization and Spray Systems (ILASS), the American Physical Society (APS), the Combustion Institute (CI) and the American Society of Mechanical Engineers (ASME).

Past events



ILASS 2017 held at the CMT-Motores Térmicos. Universitat Politècnica de València between 6-8 September welcomed 219 participants, coming from around 20 countries. This is another ILASS-Europe successful conference, gathering industrial and academic researchers who shared the most recent developments in the field of atomization and spray systems.

Congratulations are due to the local organizers, led by the Conference Chair, Prof. Raúl Payri and the Conference Coordinator Dr. Xandra Margot.

134 high quality papers were fully reviewed and presented in groups of 3 parallel sessions, in a total of 28 technical sessions.

The technical programme also included 3 excellent keynote lectures:

Toward a fully simulated injection: from the in injector flow to the final spray

FRANCOIS-XAVIER DEMOULIN • CORIA-Université de Rouen (France)

Spray cooling

CAMERON TROPEA ▪ Technische Universität Darmstadt (Germany)

Edges, Moving Surfaces, Thin Films.... Unusual Drop Impact Conditions

ALIDAD AMIRFAZLI ▪ York University (Canada)

The ILASS 2017 Proceedings can be consulted [here](#). All the published papers were assigned with a unique doi.

Other Events



SWEP “Surface Wettability Effects on Phase Change Phenomena”

This workshop aims at providing a forum and a brainstorming session for researchers to exchange knowledge on two-phase flows experiments, modeling and simulation, to discuss with worldwide experts their current research, and to propose a better comprehension on the effect of surface wettability on phase-change phenomena.

Nine invited lecturers will give stimulating lectures on various topics related to SWEP:

1. David Brutin, Polytech' Marseille, France
 2. Daniel Attinger, Iowa State University, USA
 3. Paolo di Marco, University of Pisa, Italy
-

4. Carlo Antonini EMPA, Switzerland
5. Davide del Col, University of Padova, Italy
6. Vadim Nikolayev, CEA, France
7. James Sprittles, University of Warwick, UK
8. Rohit Pillai, University of Edinburgh, UK
9. Yukihiro Yonemoto, Kumamoto University, Japan

DEADLINES:

Abstract submission is 28 February 2018

Acceptance of the abstract 15 March 2018

Submission of the final abstract and early bird payment 30 March 2018

REGISTRATION at <https://delegate.brighton.ac.uk/swep2018>

For any enquire about the organisation and logistics, send an email to: Southcoastevents@brighton.ac.uk

WORKSHOP CHAIRS

Prof. Marco Marengo, University of Brighton

Prof. Joel De Coninck, University of Mons



ICONBM 2018

INTERNATIONAL CONFERENCE ON BIOMASS

17 - 20 June, 2018 - Bologna, Italy

On behalf of The Italian Association of Chemical Engineering, we warmly welcome you to the next International Conference on Biomass which will be held from 17 to 20 June 2018 in the city of Bologna. We look forward to meeting you in this world-class event that provides a very interesting programme with the opportunity to exchange ideas with colleagues from all sectors, including academia and industry and share presentations of the latest key innovations within sustainable bioenergy technologies and solutions.

Please visit the conference website for more details: <http://www.aidic.it/iconbm2018/index.php>

IMPORTANT DATES:

November 25, 2017-Abstract Submission Deadline

December 1, 2017-Abstract Acceptance

January 15, 2018-Manuscript Submission Deadline

March 30, 2018-Manuscript Acceptance

April 15, 2018-Early Registration Deadline

May 15, 2018-Preliminary Programme

June 17, 2018-Conference

ICONBM

Scientific

Committee

Chairmen:

Prof. Eliseo Ranzi, Politecnico di Milano

Prof. Mario Costa, University of Lisbon



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19th International Symposium on Applications of Laser and Imaging Techniques to Fluid Mechanics
16 - 19 July 2018

The 19th edition of the symposium will be held in the Portuguese capital of Lisbon, at the Congress Center of Gulbenkian Foundation, as were all the previous meetings since 1982.

Internationally known simply as the LISBON SYMPOSIA, the event gives the opportunity for researchers and industries to connect and share new advances in laser and imaging techniques for thermo-fluid-dynamics studies, as well as the latest applications in the field.

The conference program is composed of scientific and technologic contributions, bringing together world leading manufacturers of laser and imaging equipment for fluid flow research to show off their most recent developments and achievements face-to-face with a qualified audience looking for the latest tools and technologies.

Please visit the conference website for more details: <http://lisbon-lasersymposium.org/lxlaser2018>

Submissions are under evaluation by the Advisory Committee and authors will be notified about their acceptance after March 16. The [scientific program](#) will then be constructed, consisting of parallel sessions, three invited lectures in emerging fluid dynamic applications of laser techniques, and a plenary session featured by the exhibitors. We hope to provide ample opportunity for attendees to be acquainted with the latest laser-based techniques developed for fluid flow research.

For now, we can confirm that keynote lectures will be given by:



Kenny Breuer

Kenny Breuer is a Professor of Engineering at Brown University. His research interests are in the broad field of Fluid Dynamics. He has researched diagnostic techniques for micron-scale and near-surface velocimetry, the characterization of slip flows, the mechanics of bacterial motility and nanoscale flow near a moving contact line.

Read more [here](#)



Marc Brunel

Marc Brunel is Professor at the University of Rouen, in the CORIA laboratory, animator of the group “Laser/particles Interactions” and member of the Scientific Council of CORIA Laboratory. His interests are in light/particles interactions, optical diagnostics of droplets and bubbles, interferometric imaging, digital holography, femtosecond fiber lasers, nondiffracting beams.

Read more [here](#)



Marie Oshima

Marie Oshima is a Professor at the Department of Mechanical and Biofunctional Systems of the University of Tokyo and a researcher at the Centre for Research on Innovative Simulation Software (CISS). Currently, she has been engaged in computational hemodynamic, particularly medical-image based modelling and cerebrovascular flow simulation for medical applications.

Read more [here](#)

We will announce any further developments through social media, so please make sure to follow us and keep up with the Twitter hashtag [#lxsymp2018](#).

If you have any questions, please email us at helpdesk@lisbon-lasersymposium.org.

We look forward to welcoming you in Lisbon!

António Moreira

Organizing Committee



Open positions

See these and other relevant events at [our website](#)



Engineering Science Master Internship

Kinematic characterization of liquid-gas interfaces. Application to liquid-jet experimental images in the near field.

Place	CNRS UMR 6614 – CORIA, Site Universitaire du Madrillet, 76801 Saint Etienne du Rouvray, TASC Department (Turbulence, Atomization & Sprays, Chaos), Atomization & Spray Group
Contact	J.B. Blaisot (blaisot@coria.fr , +33 232 953 676), F. Thiesset (thiesset@coria.fr , +33 232 953 706)
Keywords	Multiphase flows, Primary atomization, image analysis, interfaces.
Period	4 to 5 months starting in February or March 2018
Monthly wage	Around 550€

Context and Objectives: Two-phase flows reveal interfaces separating the liquid and the gas phase. The quantification and characterization of the interaction between the interface geometrical properties (e.g. its curvature) and its kinematic features

(the displacement speed in the surface normal direction) remains a tremendous challenge. In the past few years, the Atomization & Spray group at CORIA laboratory developed some tools allowing the exploration of primary atomization phenomena with special emphasis on the evolution of the geometry of the liquid-gas interface. Using high-speed cameras, a quantification of the interface kinematic properties becomes feasible which will allow better understanding the coupling between interface velocity and geometry.

Throughout this internship, the applicant will develop and validate some procedures to assess the kinematic properties of liquid-gas flows. Two distinct and complementary methods are envisaged. The first relies on an image correlation technique [1] and the second method is based on the level-set transport equation [2]. The applicant will benefit from existing libraries in C and python for image analysis, contour extraction and level-set calculations and will develop his/her own tools which will be incorporated to these libraries. A validation step will be carried out on the basis of synthetic images and of Rayleigh jets experimental images. Once the methods validated, they will be applied to liquid jet images in the near field of the injector with the purpose of assessing the kinematic properties of the liquid-gas interface in presence (or not) of cavitation.

Expected outcomes:

- Some python/C codes for measuring the global velocity of the liquid-phase and the local interface displacement speed.
- Some results concerning the application of the procedures to liquid jets injection affected or not by cavitation.
- A primary analysis of the results with particular emphasis on the effect of cavitation on the atomization process.

References:

[1] D. Sedarsky, S. Idlahcen, C. Rozé, J.B. Blaisot. *Exp Fluids* (2013) 54:1451.

[2]. Thiesset, F. & Halter, F. & Bariki, C. & Lapeyre, C. & Chauveau, C. & Gokalp, I. & Selle, L. and Poinot, T. (2017) *J. Fluid Mech.* 831, pp. 618-654

Application: The candidate's experience must align with some of the project thematic fields, namely optics, multiphase flows or image processing. A strong background in fluid mechanics is required and knowledge of C and python coding is mandatory. A master degree, obtained or in progress, is required. Applicants will send a CV and a motivation letter.



Engineering Science Master Internship

3D Imaging Techniques in Spray Measurement

Place	CNRS UMR 6614 – CORIA, Site Universitaire du Madrillet, 76801 Saint Etienne du Rouvray, TASC Department (Turbulence, Atomization & Sprays, Chaos), Atomization & Spray Group
Contact	J.B. Blaisot (blaisot@coria.fr , +33 232 953 676)
Keywords	Plenoptic camera, image processing, atomization, spray
Period	4 to 5 months starting in February or March 2018
Monthly wage	Around 550€

Context and Objectives:

Application of image-based drop sizing techniques to spray remains an issue, particularly for large sprays, and leads at least to a partial characterization of the spray. A tomography-like imaging approach based on an imaging model was developed at Atomization & Spray group. The entire spray can thus be characterized statistically by aggregating data collected from the different scans. The objective of this internship is to test 3D imaging techniques allowing measurement on a wide depth of field allowing to gather the entire spray with only one measurement.

Light field imaging is a promising technique in that sense. The light field is a combination of intensity and orientation data characterizing the light reaching the camera objective. Plenoptic cameras are used to record the light field and to reconstruct any desired image corresponding to a particular focusing location. This reconstruction can be used to build a set of images covering the entire spray.

During the internship, a bibliographic review of 3D imaging techniques will first be conducted by the applicant with a particular attention on the principle of image reconstruction in light field imaging. A particular focus will be put on the lateral and axial resolutions of reconstructed images.

Experiments will be conducted to test light field imaging on sprays. The limits (droplet density, resolution, point spread function...) will be determined, using the imaging model above mentioned.

Expected outcomes:

Bibliographic review on light field and 3D imaging with a focus on application to spray measurements. Analysis of image reconstruction performances with plenoptic camera. Determination of resolution limits for reconstructed images. Analysis of applicability of light field imaging to spray measurements.

Références:

N. Fdida, J.B. Blaisot «*Drop size distribution measured by imaging: determination of the measurement volume by the calibration*

of the point spread function». Meas. Sci. Technol, 2010, 21() 025501 (15pp).

C. Dumouchel, J.B. Blaisot «Multi-Scale Analysis of Liquid Atomization Processes and Sprays». ILASS-Europe 2013, Chania, Grèce.

J.B. Blaisot «Size and Drop Size Distribution Measurements by Image Analysis». ICLASS 2012, Heidelberg, Allemagne.

T. Nonn, V. Jaunet, C. Weissman «Particle Size and Velocity Measurements using Light-Field Velocimetry». ILASS Americas, 24th Annual Conference on Liquid Atomization and Spray Systems, San Antonio, TX, May 2012

R. Ng «Digital Light Field Photography». PhD Stanford University, California, 2006

A. Jafek, J. Belden, T. Truscott «Resolving gas-liquid interface geometry using light field imaging». 67th Annual Meeting of the APS Division of Fluid Dynamics, November 23–25, 2014; San Francisco, California

Application:

The candidate's experience must align with some of the project thematic fields, namely optics, multiphase flows or image processing. A master degree, obtained or in progress, is required. Applicants will send a CV and a motivation letter.



Engineering Science Master Internship

Injection & atomization of fuel in high pressure/high temperature environment with advanced optical diagnostics

Place	CNRS UMR 6614 – CORIA, Site Universitaire du Madrillet, 76801 Saint Etienne du Rouvray, TASC Department (Turbulence, Atomization & Sprays, Chaos), Atomization & Spray Group
Contact	J.B. Blaisot (blaisot@coria.fr , +33 232 953 676), C. Rozé (roze@coria.fr , +33 232 953 755)
Keywords	Atomization, Fuel injection, liquid-gas interface tracking, velocimetry
Period	6 months starting in February or March 2018
Monthly wage	Around 550€

Context and objectives:

In the context of pollutant emission reduction and engine performance enhancement, a great attention is put on the fuel injection process. The efficiency of the injection and of the atomization of fuel has noticeable consequences on evaporation, mixing and combustion processes. This work focuses on the characterization of the fuel injection flow, in the near field of the nozzle orifice of a single-hole, Diesel-like injector. The working conditions are representative of engine conditions, i.e. high environmental temperature and pressure, but with an environment filled with inert nitrogen gas to prevent any combustion. Thus the attention is put on characterizing the atomization process. This work is placed in the framework of the international project ECN (<https://ecn.sandia.gov/>) with the objective of providing complementary information to complete the database.

During this internship, the applicant will make use of some of the advanced optical techniques developed at CORIA lab such as femtosecond imaging, ballistic imaging and laser correlation velocimetry. Indeed, the liquid phase velocity will be measured in the near field by employing a two-pulse femtosecond imaging techniques associated to a liquid structure correlation technique. It will also be possible, in accordance with the progress of the work of the applicant, to test other optical techniques such as ballistic imaging or laser correlation velocimetry. The environmental conditions considered here (high temperature and pressure) combined with the use of these advanced optical technics make this work very challenging and of great scientific interest.

References:

D. Sedarsky, S. Idlahcen, C. Rozé, J.B. Blaisot. Velocity measurements in the near field of a diesel fuel injector by ultrafast imagery. *Exp. Fluids* (2013) 54:1451.

S. Idlahcen, C. Rozé, L. Méès, T. Girasole, J.B. Blaisot. Sub-picosecond ballistic imaging of a liquid jet. *Exp Fluids* (2012) 52:289–298.

C. Hespel, J.B. Blaisot, M. Gazon, G. Godard, « Laser correlation velocimetry performance in diesel applications: spatial selectivity and velocity sensitivity », *Exp Fluids* (2012) 53:245–264.

Application:

The candidate's experience must align with some of the project thematic fields, namely optics, multiphase flows or image processing. A master degree, obtained or in progress, is required. Applicants will send a CV and a motivation letter.



PhD Proposal

Experimental exploration of membranes in liquid jet atomization

Place	CNRS UMR 6614 – CORIA, Site Universitaire du Madrillet, 76801 Saint Etienne du Rouvray, TASC Department (Turbulence, Atomization & Sprays, Chaos), Atomization & Spray Group
Contact	J.B. Blaisot (blaisot@coria.fr , +33 232 953 676), F. Thiesset (thiesset@coria.fr , +33 232 953 706)
Keywords	Multiphase flows, Primary atomization, image analysis, interfaces.
Period	Oct. 2018- Oct. 2021
Monthly wage	Around 1400€ net

Abstract:

The objective of this PhD thesis is to characterize the dynamics of liquid jet atomization in which membrane fragmentation occurs. To this end, an experimental work will be undertaken with the aim of better quantifying the geometrical properties of liquid membrane when visualized by backlight illumination. A second task of the thesis will be devoted to the characterization of the physical mechanisms at play through a scale-by-scale analysis of the fragmentation of the membranes, contraction into ligaments and formation of droplets.

Context and Objectives:

The characteristics of liquid-dispersed two-phase flows condition the evolution of many natural phenomena and the efficiency of a wide variety of industrial applications. A simple observation of such two-phase flows generally reveals the early formation of wrinkled thin liquid sheets or membranes which perforate and contract in ligaments and droplets. This scenario is notably encountered in liquid flows with large transversal momentum as produced by e.g. triple-disc-geometry injectors [1, 2] or in air-assisted atomization processes (e.g. coaxial jets). Liquid membranes can also be promoted in the presence of cavitation or by adding polymers to the liquid phase. Consequently, the processes related to the liquid sheets appear as the initial condition for the creation of ligaments and for the resulting drop size distribution.

In the last few years, the Atomization & Spray group at CORIA laboratory has focused mainly on the ultimate step of the atomization processes, i.e. the stretching of ligaments and formation of droplets. To complete the picture, the objective of this PhD thesis is to shed light onto the prior step, providing quantitative data and deep analysis of the physical mechanisms at play during 1/ the liquid-jet injection and destabilization, 2/ the formation of liquid-sheets and membranes 3/ their perforation and 4/ contraction into ligaments. On the basis of our research team expertise, the applicant will first develop some experimental diagnostics for the morphological analysis of liquid structures and will propose pragmatic solutions to help distinguishing thin liquid membranes in backlight images. Experimental images will then be explored in the light of recent scale-by-scale analysis with the aim of highlighting and characterizing the multi-scale features of the fragmentation of liquid-sheets and formation of ligaments.

The main difficulty when visualizing liquid sheet is due the refraction and diffraction of light interacting with liquid structures. Generally, the liquid (gas) phase on backlight illumination images is associated with low (high) gray scale levels [3]. However, a thin liquid sheet is a transparent medium which leads to gray levels similar to those of the background. Consequently, the distinction between the gas and the liquid phase cannot be carried out on the basis of the gray level solely and another information is needed for the segmentation of images. One solution then consists in calculating the local textural (e.g. spectral) content of the images in order to discriminate between the light transmitted directly to the camera (which have very low textural content) to the one which has travelled through the liquid (which have a larger textural content). The applicability of such corrections will be validated by comparing corrected images to that inferred from the ballistic imaging technique which allow optically separating ballistic photons from that which have passed through the liquid [4]. Two flow configurations will be studied, a wrinkled liquid-sheet as formed by two obliquely impacting jets [5] and by the triple disc injector [2].

An ensuing task for the PhD work will be devoted to the characterization of the fragmentation scenario of such liquid sheets and membranes. In this context, one particular objective is to describe the multiscale content of the liquid sheet fragmentation and contraction and of the ligament formation processes. This will be undertaken on the basis of observables such as the surface based scale distribution [2] or the volume-of-fluid spatial increments by identifying the predominant terms in their respective transport equations.

References:

- [1] Dumouchel, C. (2008). *Exp. Fluids*, 45(3), pp. 371-422.
- [2] Dumouchel, C. & Grout, S. (2011) *Phys. A*, 390, pp. 1811–1825
- [3] Blaisot, J.B. & Yon, J. (2005). *Exp. Fluids*, 39, pp. 977–994
- [4] Idlahcen, S., Rozé, C., Méès, L., Girasole, T., & Blaisot, J. B. (2012). *Exp. Fluids*, 52(2), 289-298
- [5] Bremond, N., Clanet, C., & Villermaux, E. (2007). *Journ. Fluid Mech.*, 585, pp. 421-456.

Application: Funding for the PhD thesis is conditioned by the quality of the applicant. The candidate's experience must align with some of the project thematic fields, namely optics, multiphase flows or image processing. A strong background in fluid mechanics is required and knowledge of C and python coding is mandatory. A master degree or in progress is required. Applicants will send a CV and a motivation letter.

Sincerely yours,

Ana Moita

Newsletter Editor