

Jérémy Basley

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French citizenship

RESEARCH EXPERIENCE

- Since Sept.2017 **Research Associate** at Imperial College London (Dept. of Aeronautics)
United Kingdom (funding EPSRC : transpiration cooling in gas turbines ; measurements/analyses of wind-tunnel data for industrial contracts (automotive/civil eng.)
- Sept. 2015 **Research Associate**, at LHEEA : Lab. of Hydrodynamics, Energetics and Atmospheric Environment - CNRS/UMR 6598, (Nantes, France) : experimental study of an atmospheric boundary layer over large roughness elements (urban canopy models),
– Sept. 2017 - high Reynolds wind-tunnel measurements, using stereo-PIV & hot-wire
- modelling exchanges between roughness sub-layer and outer-layer.
- Apr 2014 **Research Associate**, at LadHyX : Lab. of Hydrodynamics of École Polytechnique - UMR
– Jun 2015 7646, (Palaiseau, France) : numerical study of the transition to turbulence in rotating stratified fluids.
- 2012 – 2013 **Research Assistant and Lecturer**, University Paris-Sud (Orsay, France), at LIMSI/CNRS (Laboratory of Computer Sciences for Mechanical Engineering & Information Technologies - UPR 3251) : identifying coherent structures and wave non-linear interactions.
- 2009 – 2012 **Research Assistant** (Doctoral level) investigating waves in a saturated 3D flow, using time-resolved PIV and modal decompositions
with L. Pastur & F. Lusseyran (LIMSI/CNRS, University of Paris-Sud, Orsay, France)
Australia, 1 year with J. Soria (LTRAC, Laboratory of Turbulence Research in Aerospace & Combustion, Monash University, Melbourne)
- 2008 **Research Assistant** (Engineer), LIMSI/CNRS (Orsay, France), funded by ANR project "HiSpeed-PIV" : high frame-rate PIV, Laser Doppler Velocimetry, spectral analysis
- May – Oct 2007 **Research Assistant** (Master's level), LTRAC, Monash University
Australia, 6 mths (Melbourne), with J. Soria : study of a turbulent air-jet ; hot-wire & PIV measurements.

EDUCATION

- Dec 2008 – **PhD in Physics (Fluid Mechanics)** with highest honours, under a **joint affiliation** :
Oct 2012 Luc Pastur & François Lusseyran LIMSI/CNRS – University Paris-Sud, Orsay, France
Julio Soria LTRAC – Monash University, Melbourne, Australia
Title : An Experimental Investigation on Waves and Coherent Structures in a Three-Dimensional Open Cavity Flow <http://tel.archives-ouvertes.fr/tel-00822898>
Jury : M. Stanislas (President), P. Brancher (Referee), I. Mutabazi (Referee), J.-C. Robinet, F. Moisy, L. Pastur, F. Lusseyran, J. Soria
- 2006 – 2007 **Master of Fluid Dynamics and Transfers**, inter-university diploma in Toulouse, France, (turbulence, instabilities & waves in fluids), with high honours (magna cum laude).
- concomitantly **Master of Engineering (Aerospace & Aeronautics)**, ISAE (High Institute of Aeronautics and Space, Toulouse), one of the leading Engineering schools in France
2005 – 2007 2005-2006 : general training in engineering, major in oceanography & signal processing
2006-2007 : major in Aircrafts & vehicles, specialising in Aerodynamics et engines.
- 2001 – 2005 **Bachelor of Fluid Mechanics**, University Paris-Sud 11, Orsay, France.

TEACHING EXPERIENCE

- 2017 – 2019 **Covers**, Imperial College London (Master Eng. 1st year) :
Complex numbers & trigonometry (lecture : 2h, tutor. : 2h)
Fluid dynamics (pipe flow) (Lab. : 4.5h).
- 2012 – 2013 **Research Assistant and Lecturer**, University Paris-Sud 11, Orsay, France, (96h) for the Department of Physics,
tutorials : solid mechanics & elasticity (year 4, 8h), mechanics & optics (year 1, 22h)
numerical projects : Matlab coding in physics (year 3, 33h), Fluent-ANSYS (Master, 30h)
lab work : optics (year 1, 3h).
- 2008 – 2009 **Tutoring**, University Pierre & Marie Curie 6 (UPMC), Faculty of Engineering, *lab work* (year 4, 64h) : fluid mechanics, turbulence, wall boundary layers, airfoils, hot-wire anemometry, pressure sensors.
- 2003 – 2005 **Private tuitions**, primary school to high school level.

TECHNICAL SKILLS

Experiments

- Experimental techniques PIV (cross-correlation & optical flow) and Laser Doppler Velocimetry, hot-wire anemometry, pressure measurements
- Facilities Subsonic wind-tunnels & water-tunnels
- Equipments Cameras (Photron APX-RS, PCO4000, ImperX), laser Pegasus (high repetition rate) and other pulsed-lasers (Nd-Yag), Argon laser, LDV DANTEC, SigLab, microphones...

Computer skills

- Practical knowledge Matlab, c/c++ & Open MPI (formations CNRS 2013/2015), Fortran 95, Shell, \LaTeX
- Academic Java, Fluent

Involvement in multi-partner research projects

- 2011 – 2015 **OceanicLayering project** (ANR*-contract), collaboration between : LPO (Brest), LadHyX (Palaiseau), LEGI (Grenoble), IRPHE (Marseille) \Rightarrow numerical, theoretical, laboratory & in situ measurements of layering and turbulence induced by lens-like vortices.
- 2009 – 2013 **CORMORED project** (ANR-contract), collaboration between : LEA (Poitiers), LIMSI/CNRS (Orsay), IMFT (Toulouse), DynFluid (ENSAM, Paris) \Rightarrow flow control and reduced order modelling.
- 2007 – 2011 **HiSpeed-PIV project** (ANR-contract), collaboration between : FAST (University Paris-Sud, Orsay), LIMSI/CNRS (Orsay), LadHyX (École Polytechnique, Palaiseau), UME (ENSTA, Palaiseau) \Rightarrow for pooling of high framerate PIV equipment.

* ANR : (National Agency for Research) french institution funding scientific projects involving research units or companies.

LANGUAGES

French	mother tongue	
English	fluent	overall 18 months spent in Australia, PhD thesis and defence in English Internet-based TOEFL (2010) : 108/120
German	high school level	out of practice but good basics to start with
Japanese	basics	

PUBLICATIONS

- 7 peer-reviewed articles in leading international journals
- 3 peer-reviewed proceedings of international conferences
- 22 peer-reviewed contributions to conferences
- 4 non peer-reviewed presentations (local conferences and workshops)

Peer-reviewed articles in international journals

- March 2019 [1] J. Basley, L. Perret & R. Mathis, *Structure of high Reynolds number boundary layers over cube canopies*, **J. Fluid Mech.**, Accepted.
https://jeremybasley.weebly.com/uploads/1/2/3/7/123788125/basley_etal_jfm2019_acceptedversion.pdf
- February 2019 [2] L. Perret, J. Basley & R. Mathis, *The atmospheric boundary layer over urban-like terrain : influence of the plan density on roughness sublayer dynamics*, **Boundary-Layer Meteorol.**, Vol.170, Issue 2, pp 205-234.
https://jeremybasley.weebly.com/uploads/1/2/3/7/123788125/perret_etal_blm2018.pdf
- July 2018 [3] J. Basley, L. Perret & R. Mathis, *Spatial modulations of kinetic energy in the roughness sublayer*, **J. Fluid Mech.**, 850 : pp. 584-610, 2018,
https://jeremybasley.weebly.com/uploads/1/2/3/7/123788125/basley_etal_jfm2018.pdf
- November 2014 [4] J. Basley, L. Pastur, F. Lusseyran, J. Soria & N. Delprat, *On the modulating effect of three-dimensional instabilities in open cavity flows*, **J. Fluid Mech.**, 759 : pp. 546-578, 2014,
https://jeremybasley.weebly.com/uploads/1/2/3/7/123788125/basley_jfm2014.pdf
- April 2014 [5] J. de Vicente, J. Basley, F. Meseguer-Garrido, J. Soria, T. Vassilis, *Three-dimensional instabilities over a rectangular open cavity : from linear stability analysis to experimentation*, **J. Fluid Mech.**, 748 : pp. 189-220, 2014,
https://jeremybasley.weebly.com/uploads/1/2/3/7/123788125/vicente_etal_jfm2014.pdf
- June 2013 [6] J. Basley, L. Pastur, N. Delprat, F. Lusseyran, *Space-time aspects of a three-dimensional multi-modulated open cavity flow*, **Phys. Fluids**, 25 (6) : 064105, 2013,
https://jeremybasley.weebly.com/uploads/1/2/3/7/123788125/basley_etal_pof2013.pdf
- April 2011 [7] J. Basley, L. Pastur, F. Lusseyran, T. Faure, and N. Delprat, *Experimental investigation of global structures in an incompressible cavity flow using time-resolved PIV*, **Exp. in Fluids**, 50 (4) : p.905-918, open access,
<https://link.springer.com/article/10.1007/s00348-010-0942-9>

Peer-reviewed proceedings in international journals

- September 2018 [8] L. Perret, R. Mathis & J. Basley *Flow dynamics in the roughness sublayer of atmospheric boundary layers*, in **Progress in Turbulence VIII**, to be published in 2019, proceedings of iTi Conference 2018, Bertinoro, Italie, Springer
- July 2017 [9] J. Basley, L. Perret, *Signature of a Cubical Canopy on the Spatial Dynamics of an Atmospheric Boundary Layer*, in **Progress in Turbulence VII**, pp.205-210, proceedings of iTi Conference 2016, Bertinoro, Italie, Springer,
<https://link.springer.com/book/10.1007%2F978-3-319-57934-4>

- September 2011 [10] F. Lusseyran, F. Gueniat, J. Basley, C. Douay, L. Pastur, T. Faure, P. Schmid, *Flow coherent structures and frequential signature : application of the dynamic modes decomposition to open cavity flow*, **J. of Physics : Conference Series**, proceedings of 13th EUROMECH European Turbulence Conference (**ETC13**), Varsovie, Pologne, 318(4), 042036(1-8). <https://hal-polytechnique.archives-ouvertes.fr/hal-01025972/document>

Peer-reviewed contributions to conferences

- November 2018 [11] **J. Basley**, K. A. Gouder, Y. Murai, C. Fradin, D. Glymond, L. J. M. Vandeperre, & J. F. Morrison, *Large-scale experimental study of the turbulent flow over an effusion cooling plate*, **APS-DFD 2018**, Atlanta, United States
- September 2018 [12] L. Perret, R. Mathis & J. Basley, *Flow dynamics in the roughness sublayer of atmospheric boundary layers*, **iTi 2018**, Bertinoro, Italie
- August 2017 [13] J. Basley, L. Perret, S. Herpin & R. Mathis, *Amplitude modulation of the roughness sublayer in an atmospheric surface layer*, **ETC16**, Stockholm, Suède
- September 2016 [14] J. Basley, L. Perret, *Signature of a Cubical Canopy on the Spatial Dynamics of an Atmospheric Boundary Layer*, **iTi2016**, Bertinoro, Italy
- September 2016 [15] J. Basley, L. Perret, *Coherent Structures in an Atmospheric Boundary Layer over a Cube-Based Canopy : Effect of Obstacle Plan Density*, **EFMC11**, Sevilla, Spain
- July 2015 [16] J. Basley, P. Billant, *Influence of planetary rotation on the transition to turbulence of a vertical vortex pair in a stratified fluid*, Bifurcation and Instabilities in Fluid Dynamics (**BIFD**), Paris, France
- March 2015 [17] J. Basley, P. Billant, *Nonlinear evolution of the zigzag instability in stratified-rotating fluids*, **EUROMECH Colloquium 567**, Cambridge, England
- September 2013 [18] J. Basley, L. Pastur, F. Lusseyran, J. Soria, *Reconstruction of wavelike three-dimensional coherent structures through time-resolved planar measurements*, European Turbulence Conference (**ETC14**), Lyon, France
- September 2013 [19] J. Basley, J. Soria, L. Pastur, F. Lusseyran, *Three-Dimensional waves inside an Open Cavity and Nonlinear Interactions with the impinging Shear Layer*, **ICOMASEF 2013**, Prato, Italy, https://jeremybasley.weebly.com/uploads/1/2/3/7/123788125/basley_etal_icomasef2013.pdf
- November 2012 [20] L. Pastur, F. Lusseyran, L. Mathelin, F. Gueniat, J. Basley, *Critères eulériens et lagrangiens d'identification des structures cohérentes*, 32^{ème} Journée Thématique de l'**AFVL**, Jussieu, Paris, France
- September 2012 [21] L. R. Pastur, Y. Fraigneau, F. Lusseyran, J. Basley, C. Douay, *From linear stability analysis to three-dimensional organization in an incompressible cavity flow*, 9th European Fluid Mechanics Conference (**EFMC9**), Rome, Italy
- September 2012 [22] C. Douay, J. Basley, L. R. Pastur, F. Lusseyran, T. Faure, *Secondary centrifugal instability in a cavity shear flow : experimental study*, 9th European Fluid Mechanics Conference (**EFMC9**), Rome, Italy
- August 2012 [23] C. Douay, F. Lusseyran, J. Basley, L. R. Pastur, Y. Fraigneau, T. Faure, *First and second centrifugal spanwise instabilities in an open cavity flow*, 23rd International Congress of Theoretical and Applied Mechanics (**ICTAM**), Beijing, China, 1-2
- March 2012 [24] L. Pastur, Y. Fraigneau, F. Lusseyran, T. Faure, J. Basley, C. Douay, *Three-dimensional organisation in an incompressible cavity flow*, 47th Symposium on Applied Aerodynamics (**AAAF 2012**), Paris, France
- September 2011 [25] F. Lusseyran, F. Gueniat, J. Basley, C. Douay, L. Pastur, T. Faure, P. Schmid, *Flow coherent structures and frequential signature : application of the dynamic modes decomposition to open cavity flow*, 13th EUROMECH European Turbulence Conference (**ETC13**), Warsaw, Poland. Published in **J. of Physics : Conference Series**, 318(4), 042036(1-8). <http://dx.doi.org/10.1088/1742-6596/318/4/042036>

- July 2011 [26] T. Faure, C. Douay, J. Basley, H. Thach, L. Pastur, F. Lusseyran, *Cavity flow stability analysis with space phase-averaged velocity fields*, 4th International Symposium Bifurcation and Instabilities in Fluid Dynamics (**BIFD 2011**), Barcelona, Spain
- September 2010 [27] T. Faure, H. Thach, J. Basley, L. Pastur, F. Lusseyran, *Moyenne de phase spatiale appliquée à des champs PIV résolus en temps*, 12^{ème} Congrès Francophone de Techniques Laser, Nancy, France
- September 2010 [28] N. Delprat, J. Basley, L. Pastur, F. Lusseyran, T. Faure, *Investigation of the different amplitude modulated regimes observed in an experimental incompressible cavity flow*, 8th European Fluid Mechanics Conference (**EFMC8**), Bad Reichenhall, Germany
- September 2010 [29] F. Alizard, J. Basley, J. Robinet, T. Faure, L. Pastur, X. Gloerfelt, F. Lusseyran, N. Delprat, *Flow dynamics in open square cavity : experimental and stability comparisons*, 8th European Fluid Mechanics Conference (**EFMC8**), Bad Reichenhall, Germany
- September 2010 [30] J. Robinet, F. Alizard, J. Basley, T. Faure, X. Gloerfelt, L. Pastur, F. Lusseyran, N. Delprat, *Dynamics in open square cavity : from linear instability to saturated regime*, 8th European Fluid Mechanics Conference (**EFMC8**), Bad Reichenhall, Germany
- June 2010 [31] L. Pastur, F. Lusseyran, N. Delprat, T. Faure, J. Basley, F. Gueniat, *Reduction of flow complexity within a few dynamical modes : the case of an open-cavity air-flow*, 11th Experimental Chaos and Complexity Conference (**ECC11**), Lille, France
- August 2009 [32] J. Basley, L. R. Pastur, F. Lusseyran, T. M. Faure, N. Delprat, 8th Int. Symposium on Particle Image Velocimetry (**PIV09**), Melbourne, Australia, *Experimental investigation of global structures in an incompressible cavity flow using time-resolved PIV*, pp. 83-86

Non peer-reviewed presentations (local conferences and workshops)

- November 2011 [33] J. Basley, C. Douay, Y. Fraigneau, L. R. Pastur, F. Lusseyran, *Instabilités transverses dans les écoulements de cavité ouverte*, Day of Fluid Dynamics at the University Paris-Sud, Orsay, France
- May 2011 [34] J. Basley, C. Douay, L. R. Pastur, F. Lusseyran, J. Soria, *Comprendre pour mieux contrôler un écoulement ouvert : une étude expérimentale* (poster), DGA Conference for Research and Scientific Advances, Ecole Militaire, Paris, France
- April 2010 [35] J. Basley, L. R. Pastur, F. Lusseyran, *Global organisation in an incompressible cavity flow investigated through experimental time-resolved velocity fields*, Conference of Doctoral candidates MIPEGE (Faculty of Sciences - Department of Physics), University Paris-Sud, Orsay, France
- February 2010 [36] J. Basley, L. R. Pastur, N. Delprat, Y. Fraigneau, F. Lusseyran, *Structuration globale des écoulements* (poster), Colloque Bouyssi (Faculty of Sciences - Department of Physics), University Paris-Sud, Orsay, France