

# Laurent Y.M. GICQUEL

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## SKILLS

- ▷ **Scientific Expertise:** Energetic and Propulsion, Heat Transfer, Turbulent Reacting Flow Simulations, Multi-phase flows, Turbomachinery Flows, Flow instabilities, Modeling and High Performance Parallel Computing.
- ▷ **Management and Formation** on subjects related to aeronautical propulsion and energy production.
- ▷ **Proposal Organization, Writing and Management** of National and European research projects.
- ▷ **Management, Execution of multiple contractual activities** with major European industries involved in propulsion and energy production.
- ▷ **ERC award co-recipient:** Co-PI of the SCIROCCO and INTECOCIS research projects (collaborative work between CERFACS & IMFT).

### All of the above activities involve collaborations with:

**Research Groups:** EM2C (CentraleSupélec Paris), ONERA, CORIA (Rouen), LMFA (Ecole Centrale, Lyon), Stanford University (USA), Pittsburgh University (USA), Cambridge University (UK), Imperial College (UK), Czestochowa University (Poland), DLR (Germany), Darmstadt University (Germany), Twente University (Netherlands), University of Florence (Italy), University of Rome (Italy)...

**Industrial Groups:** SAFRAN, EDF, MBDA, ARIANE Group, AIRBUS, CNES, Rolls-Royce, AVIO, SIEMENS, ANSALDO, Honeywell...

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## WORK EXPERIENCE

### • Associate Project Leader

February 2017 – Present

Complementarily to pre-existing duties on research and training, this new position infers responsibilities in the **coordination, management of the CERFACS CFD team**.

*CFD Team*

*CERFACS, Toulouse, France*

### • Out of Category Senior Researcher

February 2009 – Present

This position infers the **coordination, management and search** of financial resources for research projects with industrial implications in the field of turbulent reacting flows and aeronautical applications. In parallel, the **training and formation** of Ph.D. students and engineering teams are also required as well as actions for **research valorization, publication and project execution**.

*CFD Team*

*CERFACS, Toulouse, France*

### • Senior Researcher

February 2004 – February 2009

This position aims at the **management, demonstration and transfer** of CERFACS' CFD solutions to industries. The **training and formation** of engineering teams and young researchers are also needed along with **journal publications**.

*CFD Team*

*CERFACS, Toulouse, France*

### • Research Engineer

March 2003 – January 2004

**Dispatched from CERFACS** for the training of SAFRAN combustion team and the preparation of CERFACS' massively parallel computing solution transfer to SAFRAN's propulsion applications.

*Combustor Team*

*Turbomeca (SAFRAN Group), Bordes, France*

## EDUCATION

### • Habilitation to Conduct Research (Thermo-fluid sciences), June 2007

National Polytechnic Institute of Toulouse (INPT), Toulouse, FRANCE

Dissertation: *LES of Turbulent Reacting Flows*. Advisor: Prof. T. Poinsot.

### • Ph.D. in Mechanical Engineering (Thermo-fluid sciences), May 2001

State University of New York (SUNY) at Buffalo, Buffalo, NY, USA

Dissertation: *Velocity Filtered Density Function for Large Eddy Simulation of Turbulent Flows*.

Advisor: Prof. P. Givi (sponsored by the NASA Langley, the NASA Glenn and the U.S. Air Force).

### • M.S. in Aerospace Engineering (Thermo-fluid sciences), February 1997

SUNY at Buffalo, Buffalo, NY, USA

Thesis: *Explicit Algebraic Turbulent Closures in LARCK*.

Advisor: Prof. P. Givi (sponsored by the NASA Langley and the U.S. Air Force).

## AWARDS AND DISTINCTIONS

### • **Combustion Institute Fellow award**

February 2019

*Combustion Institute*

*Combustion Institute*

**Fellow award:** for outstanding research in LES of turbulent reacting flow and thermo-acoustic instability prediction of real engines.

### • **Ter@tec Trophees**

June 2015

*Ter@tec*

*Forum Ter@tec*

**Collaboration trophée:** Best collaborative industrial and research (Turbomeca / CERFACS) around the problem of Combustor / Turbine interactions.

### • **PRACE award**

March 2014

*PRACE*

*PRACE industrial seminar*

**Most innovative industrial HPC solution in Europe:** application, development and validation of a turbulent reacting flow solver for real applications.

### • **Research Fellow**

July 2008 – August 2008

*CTR Summer Program*

*Stanford University, California, USA*

**Research Scholarship for the 2008 CTR Summer Program:** LES of turbulent reacting two-phase flows in an experimental advanced burner.

## TEACHING AND TRAINING

### • **Best practice in combustion CFD: flame stabilization and combustion instabilities**

November 3-4, 2015

*ERCOFTAC Lecture Series*

*Delft University of Technology, Netherlands*

- Lecture 3 - Best practice guidelines for LES of gas turbine combustion - Part I

- Lecture 4 - Best practice guidelines for LES gas turbine combustion - Part II

This lecture series has been produced in collaboration with major European Professors and Experts in the field of combustion. The notes and structure of this course is also linked with an ERCOFTAC book referenced in the list of articles provided above and detailed in the attached resume.

### • **Compressible LES for airframe noise**

March 25-28, 2013

*VKI Lecture Series*

*VKI-LS, Rhode-St-Genèse, Belgium*

Course on Accurate and Efficient Aeronautic Prediction Approaches for Airframe Noise: produced in collaboration with major European Professors and Experts in the field.

### • **Flame Stabilisation for Burners**

September 26-27, 2011

*ERCOFTAC SIG28 Course*

*GE Global Research Centre, Munich, Germany*

Course on Modern developments - LES on real configurations & flameless combustion: produced in collaboration with major European Professors and Experts in the field.

### • **Finite Element Methods**

February 2007 – 2015

*Mechanical Engineering - ISAE (ENSICA)*

*ISAE-Ensica, Toulouse, France*

Instruction of the finite element method for the resolution of partial differential equations: application to the steady and unsteady heat equation, wave and elasticity equations.

### • **Advanced Numerical Methods**

October 2001 – 2014

*MFN - ENSEEIHT*

*ENSEEIHT, Toulouse, France*

Instructed advanced numerical approaches for the treatment of boundary conditions in CFD.

Formation to advanced CFD codes for industrial use (AVBP).

### • **CERFACS Training Sessions**

2011-Present

*CERFACS Training*

*CERFACS, Toulouse, France*

- Turbulent reacting flows,
- Turbulent flows and CFD of turbomachinery,
- Advanced CFD methods,
- Turbulence modeling,

All these sessions are conducted within the Formation training group of CERFACS (<http://www.cerfacs.fr/18-25708-Accueil.php>) and are accompanied with E-Learning supports.

• **Current and past PhD students**

Name	Research subject	Funding	Period	Current Position
C. Gout	LES and chorochrony	SAFRAN Tech	2018-2021	PhD student
S. Agarwal	Film cooling optimization	SAFRAN AE	2018-2021	PhD student
S. Esnault	Liner aerothermy	CERFACS	2017-2020	PhD student
M. Queguineur	Turbo-pump stability	ArianeGroup / CNES	2017-2020	PhD student
M. Thomas	Combustor / turbine interactions	Cifre Turbomeca	2016-2019	PhD student
M. Harnieh	NGV cooling design	PIA Cascade	2016-2019	PhD student
I. Mayo	Ribbed channels and aerothermy	VKI funding	2015-2017	Rolls-Royce Plc
P. Aillaud	LES and CHT in a NGV	CERFACS	2015-2018	Res. Eng.
T. Grosnickel	LES of turbine cooling channels	CERFACS	2015-2018	SAFRAN HE
T. Bridel	LES for turbo-pump	CNES / Vernon	2014-2017	ISAE Post.-Doc Fellow
C. Becerril	Direct and indirect noise predictions	CERFACS funding	2013-2016	Altran
L. Troth	Heat transfer in turbomachinery	Marrie-Currie	2013-2016	Post.-Doc Fellow
S. Berger	Multi-Physics LES	CIFRE Turbomeca	2012-2015	Post.-Doc Fellow
A. Gahni	Thermo acoustic instabilities	EU funding	2012-2015	TU Munich
D. Papagiodanis	LES for turbomachinery	Marie-Currie	2012-2015	SAFRAN Tech
C. Koupper	Combustor/turbine simulation	CIFRE Turbomeca	2012-2015	SAFRAN HE
D. Barré	Ignition sequence prediction	CIFRE Snecma	2010-2013	Post.-Doc., GDTEch
E. Collado <sup>1</sup>	Code coupling: combustor/turbine	CIFRE Turbomeca	2009-2012	Turbomeca
R. Fransen	Conjugate heat transfer	CIFRE Turbomeca	2009-2012	Post.-Doc., Alg&You
S. Hermeth	Thermo acoustic instabilities	Marie-Currie	2009-2012	Post.-Doc., SIEMENS
S. Jauré	Code coupling: heat transfer	CIFRE Snecma	2009-2012	SGI
M. Kaushaar	Advanced numerics	Marie-Currie	2008-2011	CFD Eindhoven
P. Sierra <sup>2</sup>	Euler-Euler modeling	Marie-Currie	2008-2011	Georgia Tech., Alstom
A. Eyssartier	Ignition prediction	CIFRE Snecma	2008-2011	Altran
P. Wolf	Thermo acoustic instabilities	CIFRE DGA	2007-2011	Post.-Doc. Fellow
A. Roux <sup>3,4</sup>	Ramjet instabilities	CIFRE DGA	2006-2009	Turbomeca, AIRBUS IW

**EXTRA  
CURRICULUM  
ACTIVITIES**

• **Scientific related activities and dissemination actions:**

- Colloquium organisation:

ETMM12 International ERCOFTAC Symposium on Engineering Turbulence Modelling and Measurements, Program Committee Member, Montpellier - September 26 - 28, 2018.

ETMM12 International ERCOFTAC Symposium on Engineering Turbulence Modelling and Measurements, *Large Eddy Simulations and High-Order methods for the prediction of Turbomachinery Flows* (in collaboration with F. Duchaine, J. Dombard and J.-F. Boussuge), Montpellier - September 26 - 28, 2018.

37<sup>th</sup> Combustion Symposium, Colloquium Chair for the *Gas Turbine - Rocket Combustion Colloquium* to be held in Dublin, Ireland - July 29 - August 3, 2018.

36<sup>th</sup> Combustion Symposium, Colloquium Co-Chair for the *Gas Turbine Combustion Colloquium* to be held in Coex, Seoul, Korea - July 31 - August 5, 2016.

Numerical Combustion 2105, *High-Fidelity Multi-Physics* mini-symposium organisation (in collaboration with F. Duchaine), Avignon, France, April 19-22, 2015.

Multiphysics and Unsteady Simulations for Aeronautical Flows (MUSAF), October 2010, Toulouse, France (<http://www.cerfacs.fr/musaf>).

- Conference session chair:

ETMM12 International ERCOFTAC Symposium on Engineering Turbulence Modelling and Measurements, *Large Eddy Simulations and High-Order methods for the prediction of Turbomachinery Flows*, Montpellier - September 26 - 28, 2018.

37<sup>th</sup> Combustion Symposium, Dublin, Ireland, July 29 - August 3, 2018.

35<sup>th</sup> Combustion Symposium, San Francisco, CA, USA, August 4-8, 2014.

CRCT Workshop, IFP Energies Nouvelles, Reuil-Malmaison, April 1st, 2007.

CEAS-ASC Workshop, Instituto Superior Tecnico, Lisbon, Portugal, September 17-18, 2007.

- Governance:

CERFACS representative at the CIRT (Consortium industrie-recherche en turbomachine).

Doctoral School "Mécanique, Énergétique, Génie civil & Procédés" (MEGeP) representative.

Member of the Scientific Council of 'CALCUL' (Groupe De Recherche CNRS).

Member of the Scientific Council of 'EDGES' (Young researcher ANR grant of A. Giauque - LMFA).

<sup>4</sup>Recipient of the 'Léopold Escande' best PhD dissertation award for 2012 - Price from INPT.

<sup>3</sup>Selected for the best 2010 DGA PhD dissertation award.

<sup>2</sup>Recipient of the 'Léopold Escande' best PhD dissertation award for 2009 - Price from INPT.

<sup>1</sup>Recipient of the 'Amelia Earhart' fellowship award for 2011 - Price from Zonta International.

• **Reviewer for:**

- Scientific Journals:

*Combustion:* Progress in Energy and Combustion Science, Combustion and Flame, Combustion Institute, Combustion Science and Technology, Flow Turbulence and Combustion, Combustion Theory and Modelling,

*Fluids:* Journal of Fluid Mechanics, Physics of Fluids, AIAA Journal, J. of Turbulence, Journal of Propulsion and Power, Comptes Rendus de l'Académie des Sciences - Série Mécanique,

*Computational Physics:* Computers and Fluids, Journal of Scientific Computing,

*Thermal Science:* Int. Journal of Thermal Sciences, Oil & Gas Science and Technology, Chemical Eng. J., Chemical Process and Modeling, FUEL, Int. J. of Heat and Fluid Flow, Int. J. of Heat and Mass Transfer, Int. J. of Thermal Sc., ASME IGITI, CEAS Aerospace J.

- French and European Funding agencies: Agence Nationale pour la Recherche (ANR), European Community - evaluation of research projects.

- International agencies: DoE ALCC (Leadership Computing Challenge, USA) - evaluation of research projects; Research Foundation Flanders - FWO (Netherlands) - evaluation of research projects; Technology Foundation STW (Netherlands) - evaluation of research projects; Redaction and recommendation proposal for a call opening from NSF / AFOSR (RTE) (USA).

• **Scientific Society Member:**

American Institute of Aeronautics and Astronautics (AIAA), Aerospace Combustion Institute, ASME, ERCOFTAC, Groupement Français de Combustion (GFC).

**LANGUAGES**

French (Native Language), English (fluent conversational and written), German (basic knowledge).

**REFERENCES**

Available upon request.

**Journal Papers / Book Chapters:**

- M. Harnieh, M. Thomas, R. Bizzari, J. Dombard, F. Duchaine and L. Gicquel "Assessment of a coolant injection model on cooled high-pressure vanes with large-eddy simulation" submitted to *Flow, Turbulence and Combustion*, February, 2019, (in press).
- M. Queguineur, L.Y.M. Gicquel, F. Dupuy, A. Misdariis and G. Staffelbach "Dynamic mode tracking and control with a relaxation method," in *Physics of Fluids*, February, 2019 (in press).
- N. Odier, M. Sanjosé, L. Gicquel, T. Poinot, S. Moreau and F. Duchaine "A characteristic inlet boundary condition for compressible, turbulent, multi-species turbomachinery flows," *Computers and Fluids*, June, 2018 (in press).
- I. Mayo, T. Arts and L.Y.M. Gicquel, "The three-dimensional flow field and heat transfer in a rib-roughened channel at large rotation numbers," *IJHMT*, Vol. 123, pp. 848–866, August, 2018.
- J. de Laborderie, F. Duchaine, L.Y.M. Gicquel, O. Vermorel, G. Wang and S. Moreau, "Numerical analysis of a high-order unstructured overset grid method for compressible LES of turbomachinery," *Journal of Computational Physics*, Vol. 363, pp. 371–398, June, 2018.
- B. Rochette, F. Collin-Bastiani, L.Y.M. Gicquel, O. Vermorel, D. Veynante and T. Poinot, "Influence of chemical schemes, numerical method and dynamic turbulent combustion modeling on LES of premixed turbulent flames," *Combustion & Flame*, Vol. 191, pp. 417–430, May, 2018.
- R. Bizzari, D. Lahbib, A. Dauptain, F. Duchaine, L.Y.M. Gicquel and F. Nicoud, "A Thickened-Hole Model for Large Eddy Simulations over Multiperforated Liners," *Flow, Turbulence and Combustion*, pp. 1–13, April, 2018. doi.org/10.1007/s1049
- P. Roy, L. Segui, J.-C. Jouhaud and L.Y.M. Gicquel, "Resampling strategies to improve surrogate model-based uncertainty quantification: Application to LES of LS89," *International Journal for Numerical Methods in Fluids*, Vol. 87, Issue 12, pp. 607–627, March, 2018. doi.org/10.1002/flid.4504
- S. Berger, L.Y.M. Gicquel and F. Duchaine, "Bluff-body Thermal Property and Initial State Effects on a Laminar Premixed Flame Anchoring Pattern," *Flow Turbulence and Combustion*, Issue 2, 2018. ISSN 1573-1987, doi:10.1007/s10494-017-9841-y.
- S. Moreau, C. Becerril and L.Y.M. Gicquel, "Large Eddy Simulation prediction of indirect combustion noise in the Entropy Wave Generator experiment," *International Journal of Spray and Combustion Dynamics*, December 11, 2017. doi:10.1177/1756827717740775
- P. Aillaud, L.Y.M. Gicquel and F. Duchaine, "Investigation of the concave curvature effect for an impinging jet flow," *Physical Review Fluids*, **2**(11), pp. 114608 - 34 pages, 2017.
- T. Bridel-Bertomeu, L.Y.M. Gicquel and G. Staffelbach, "Large scale motions of multiple limit-cycle high Reynolds number annular and toroidal rotor/stator cavities," *Physics of Fluids*, **29**(6), pp. 065115, 2017.
- F. Duchaine, J. Dombard, L.Y.M. Gicquel and C. Koupper, "On the importance of the inlet boundary conditions for aerothermal predictions of turbine stages with Large Eddy Simulations," *Computers and Fluids*, 154 (September), pp. 60-73, 2017. 10.1016/j.compfluid.2017.05.024.
- T. Bridel-Bertomeu, L. Gicquel and G. Staffelbach, "Unsteady Macro-Structures from Large-Eddy Simulation of Industrial Turbopump Turbine Cavity," *AIAA Journal*, Vol. 55, No. 7, pp. 2198–2214, 2017.
- P. Aillaud, F. Duchaine, L.Y.M. Gicquel and S. Didorally, "Secondary peak in the Nusselt number distribution of impinging jet flows: A phenomenological analysis," *Physics of Fluids*, **28**(10), pp. 095110, 2016.
- S. Scholl, T. Verstraete, F. Duchaine and L.Y.M. Gicquel, "Conjugate Heat Transfer of rib-roughened internal turbine blade cooling channel using Large Eddy Simulation," *IJHFF*, 61 (October), PartB, pp. 650-664, 2016.
- B. Cuenot, R. Vicquelin, R. Riber, E. Moreau, V. Lartigue, G. Figuer, A. Mery, Y. Lamouroux, J. Richard, L.Y.M. Gicquel, T. Schmitt and S. Candel, "Advanced Simulation of Aeronautical Combustors," *Aerospace Lab*, 11 (June), pp. 1–9, 2016.
- S. Berger, F. Duchaine and L.Y.M. Gicquel, "On the sensitivity of a helicopter combustor wall temperature to convective and radiative thermal loads," *Applied Thermal Engineering*, 103:1450-1459, 2016.
- T. Livebardon, S. Moreau, L.Y.M. Gicquel, T. Poinot and E. Bouty, "Combining LES of combustion chamber and an actuator disk theory to predict combustion noise in a helicopter engine," *Combustion & Flame*, Vol. 165, issue 3, pp. 272-287, 2016.
- D. Papadogiannis, F. Duchaine, L.Y.M. Gicquel, G. Wang and S. Moreau, "Effects of SGS modeling

on the deterministic and stochastic turbulent energetic distribution in LES of a high pressure turbine stage,” J. of Turbomachinery, 138(9):091005-091005-10, 2016.

- A. Ghani, T. Poinso, L.Y.M. Gicquel and J.-D. Muller, ”LES study of transverse acoustic instabilities in a swirled kerosene/air combustion chamber,” Flow, Turbulence and Combustion, 96:207-226, 2016.

- A. Ghani, T. Poinso, L.Y.M. Gicquel and G. Staffelbach, ”LES of longitudinal and transverse self-excited combustion instabilities in a bluff-body stabilized turbulent premixed flame,” Combustion & Flame, 162(11):4075-4083, 2015.

- L.Y.M. Gicquel, O. Vermorel, F. Duchaine, E. Riber, A. Dauptain, G. Staffelbach, B. Cuenot and T. Poinso, ”Chapter 4: Gas turbine and industrial burners,” in *Best Practice Guidelines for Computational Fluid Dynamics of Turbulent Combustion*, ERCOFTAC, Belgium, 2015.

- S. Scholl, T. Verstraete, J. Torres-Garcia, F. Duchaine and L.Y.M. Gicquel, ”Influence of the thermal boundary conditions on the heat transfer of a rib-roughened cooling channel using LES,” Journal of Power and Energy, vol. 229, 5: pp. 498-507, 2015.

- M. Bauerheim, M. Cazalens, E. Riber, L.Y.M. Gicquel, B. Cuenot, S. Bourgois, M. Rullaund, L. Esclapez and T. Jaravel, ”Multiphase flow LES study of the fuel split effects on combustion instabilities in an ultra-low NOx annular combustor,” J. of Eng. for Gas Turbines and Power, 138(6):061503-061503-8, 2015.

- D. Papadogiannis, F. Duchaine, L.Y.M. Gicquel, G. Wang and S. Moreau, ”Assessment of the indirect combustion noise generated in a transonic high-pressure turbine stage,” J. of Eng. for Gas Turbines and Power, 138(4):041503-041503-8, 2015.

- C. Koupper, L.Y.M. Gicquel, F. Duchaine, , T. Bacci, B. Facchini, A. Picchi, L. Tarchi and G. Bonneau, ”Experimental and numerical calculation of turbulent timescales at the exit of an engine representative combustor simulator,” J. of Eng. for Gas Turbines and Power, 138(2):021503-021503-10, 2015.

- F. Duchaine, S. Jauré, S. Poitou, D. Quémérais, G. Staffelbach, T. Morel and L. Gicquel, ”Analysis of High Performance Conjugate Heat Transfer with OpenPALM coupler,” Computational Science & Discovery, 8 015003, (doi:10.1088/1749-4699/8/1/015003), 2015.

- C. Koupper, L.Y.M. Gicquel, F. Duchaine and G. Bonneau, ”Advanced combustor exit plane temperature diagnostics based on Large Eddy Simulations,” Flow, Turbulence and Combustion, DOI 10.1007/s10494-015-9607-2 , 2015.

- M. Bauerheim, G. Staffelbach, N.A. Worth, J.R. Dawson, L.Y.M. Gicquel and T. Poinso, ”Sensitivity of LES-based flame transfer functions for turbulent swirled flames and impact on the stability of azimuthal modes,” In *Proc. of the Combustion Institute*, 35, Issue 3, pp. 3355-3363, 2015.

- C. Koupper, G. Caciolli, L.Y.M. Gicquel, F. Duchaine, G. Bonneau, L. Tarchi and B. Facchini,, ”Development of an Engine Representative Combustor Simulator Dedicated to Hot Streak Generation,” J. of Turbomachinery, 136(11), 111007, 2014.

- G. Wang, F. Duchaine, D. Papadogiannis, I. Duran, S. Moreau and L.Y.M. Gicquel, ”An overset grids method for large eddy simulation of turbomachinery stages,” Journal of Computational Physics, Vol. 274, pp. 333-355, October, 2014.

- D. Barré, L. Esclapez, E. Riber, B. Cuenot, G. Staffelbach, B. Renou, A. Vandel, L.Y.M. Gicquel and G. Cabot, ”Flame propagation in aeronautical swirled multi-burners: experimental and numerical investigation,” Combustion & Flame, Vol. 161, issue 9, pp. 2387-2405, September 2014.

- N. Gourdain, F. Sicot, F. Duchaine and L. Gicquel, ”Large Eddy Simulations of flows in industrial compressors: a path from 2015 to 2035,” Philosophical Transactions A., Vol. 372, 20130323 (doi:10.1098/rsta.2013.0323), 2014.

- L.Y.M. Gicquel, ”Multiscale and Multiresolution Approaches in Turbulence, LES, DNS and Hybrid RANS/LES Methods: Application and Guidelines,” Book review in AIAA Journal, Vol. 52, No. 6, pp. 1342-1343, 2014.

- C. Koupper, T. Poinso, L. Gicquel and F. Duchaine, ”Compatibility of Characteristic Boundary Conditions with Radial Equilibrium in Turbomachinery Simulations,” AIAA Journal, (doi: 10.2514/1.J052915), 2014.

- M. Falese, L.Y.M. Gicquel and T. Poinso, ”LES of bifurcation and hysteresis in confined annular swirling flows,” Computers and Fluids, Vol. 89, pp. 167-178, January 2014.

- E. Masi, O. Simonin, E. Riber, P. Sierra and L.Y.M. Gicquel ”Development of an algebraic-closure-based moment method for unsteady Eulerian simulations of particle-laden turbulent flows in very dilute regime,” International Journal of Multiphase Flow, 58:257-278, 01/2014.

- S. Hermeth, G. Staffelbach, L.Y.M. Gicquel and T. Poinso, "Bistable Flame Stabilization in Swirled Flames and Influence on Flame Transfer Functions," *Combustion and Flame*, Vol. 161, issue 1, pp. 184-196, January 2014.
- L.Y.M. Gicquel and S. Moreau, "Large Eddy Simulations of Aeronautical Compressible Flows," in *VKI Lecture series - Accurate and Efficient Aeroacoustic prediction approaches*, Von Karman Institute, Belgium, 2013.
- S. Jauré, F. Duchaine, G. Staffelbach and L.Y.M. Gicquel, "Massively parallel conjugate heat transfer methods relying on LES applied to an aeronautical combustor," *Computational Science & Discovery*, 6 015008 (doi:10.1088/1749-4699/6/1/015008), 2013.
- A. Eyssartier, B. Cuenot, L.Y.M. Gicquel and T. Poinso, "Using LES to predict ignition sequences and ignition probability of turbulent two-phase flames," *Combustion and Flame*, 160 (7):1191-1207, 2013.
- D. Barré, M. Kraushaar, G. Staffelbach, V. Moureau and L.Y.M. Gicquel, "Compressible and low Mach number LES of a swirl experimental burner," *Les Comptes Rendus, Série Mécanique*, 329 (1-2):783-789, 2013.
- P. Auzillon, E. Riber, L.Y.M. Gicquel, O. Gicquel, N. Darabiha, D. Veynante and B. Fiorina, "Numerical investigation of a helicopter combustion chamber using LES and tabulated chemistry," *Les Comptes Rendus, Série Mécanique*, 341 (1-2):257-265, 2013.
- S. Hermeth, G. Staffelbach, L.Y.M. Gicquel and T. Poinso, "LES evaluation of the effects of equivalence ratio fluctuations on the dynamic flame response in a real gas turbine combustion chamber," In *Proc. of the Combustion Institute*, 34, Issue 2, p. 3165-3173, 2013.
- L.Y.M. Gicquel, G. Staffelbach and T. Poinso, "Large Eddy Simulation of Gaseous Flames in Gas Turbine Combustion Chambers," *Progress in Energy and Combustion Science*, 38, 782-817, 2012.
- E. Collado Morata, N. Gourdain, F. Duchaine and L.Y.M. Gicquel, "Effects of free-stream turbulence on high pressure turbine blade heat transfer predicted by structured and unstructured LES," *Int. J. of Heat and Mass Transfer*, 55, 5754-5768, 2012.
- P. Wolf, G. Staffelbach, L.Y.M. Gicquel, J.-D. Muller and T. Poinso, "Acoustic and Large Eddy Simulation studies of azimuthal modes in annular combustion chambers," *Combustion and Flame*, 159 (11): 3398-3413, 2012.
- N. Gourdain, L.Y.M. Gicquel and E. Collado, "RANS and LES for the Heat Transfer Prediction in Turbine Guide Vane," *Journal of Propulsion and Power*, 28 (2), p. 423-433, March/April, 2012.
- A. Dauplain, L.Y.M. Gicquel and S. Moreau "Large Eddy Simulation of Supersonic Impinging Jets," *AIAA Journal*, Vol. 50: 1560-1574, 2012.
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- M. Queguineur and L.Y.M. Gicquel "Large-Eddy Simulation for the control of rotor/stator self sustained oscillations," submitted to 13<sup>th</sup> *European Conference on Turbomachinery Fluid dynamics & Thermodynamics* ETC13, ETC2019, April 8-12, 2019, Lausanne, Switzerland.
- T. Grosnickel, F. Duchaine and L.Y.M. Gicquel "Large Eddy Simulation of the flow developing in static and rotating ribbed channels," submitted to 13<sup>th</sup> *European Conference on Turbomachinery Fluid dynamics & Thermodynamics* ETC13, ETC2019, April 8-12, 2019, Lausanne, Switzerland.
- M. Harnieh, M. Thomas, R. Bizarri, L. Gicquel and F. Duchaine, "Assessment of a coolant injection model on cooled high-pressure vanes in Large Eddy Simulation," 12<sup>th</sup> *International ERCOFTAC Symposium on Engineering Turbulence Modelling and Measurements*, ETMM12, 26-28 Sep., 2018, Montpellier, France.
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**CONFERENCES  
AND PUBLIC  
LECTURES**

**Invited lectures are identified by the symbol \***

"Large-Eddy Simulation of Combustor-turbine interactions of a lean burn gas turbine engine model," submitted to 13<sup>th</sup> *European Conference on Turbomachinery Fluid dynamics & Thermodynamics*, April 8-12, 2019, Lausanne, Switzerland.

"Large-Eddy Simulation for the control of rotor/stator self sustained oscillations," submitted to 13<sup>th</sup> *European Conference on Turbomachinery Fluid dynamics & Thermodynamics*, April 8-12, 2019, Lausanne, Switzerland.

"Large Eddy Simulation of the flow developing in static and rotating ribbed channels," submitted to 13<sup>th</sup> *European Conference on Turbomachinery Fluid dynamics & Thermodynamics*, 9, April 8-12, 2019, Lausanne, Switzerland.

"Assessment of a coolant injection model on cooled high-pressure vanes in Large Eddy Simulation," 12<sup>th</sup> *International ERCOFTAC Symposium on Engineering Turbulence Modelling and Measurements*, 26-28 Sep., 2018, Montpellier, France.

"Impact of realistic inlet condition on LES predictions of isolated high-pressure vanes," 12<sup>th</sup> *International ERCOFTAC Symposium on Engineering Turbulence Modelling and Measurements*, 26-28 Sep., 2018, Montpellier, France.

\* "High Fidelity Simulations to address Gas Turbine flows and design issues", *Keynote Lecture at the 2018 Advanced Research in Turbomachinery (ART)*, Florence, Italy, 2-6 July, 2018.

\* "Machine learning fo Advanced Gas turbine Injection Systems to Enhance combustor PeRformance (MAGISTER)", *Forum TERATEC 2018*, Atelier 1 - mercredi 20 juin, Ecole Polytechnique, Paris, France.

"Large eddy simulations of a highly loaded transonic blade with separated flow," *ASME TURBO EXPO 2018, Gas Turbine Technical Congress & Exposition*, June 11-15, 2018, Oslo, Norway.

"Study of combustion noise generation in a realistic turbine stage configuration," *ASME TURBO EXPO 2018, Gas Turbine Technical Congress & Exposition*, June 11-15, 2018, Oslo, Norway.

"Large eddy simulations in a transonic centrifugal compressor," *ASME TURBO EXPO 2018, Gas Turbine Technical Congress & Exposition*, June 11-15, 2018, Oslo, Norway.

"Importance of boundary layer transition in a high-pressure turbine cascade using LES," *ASME TURBO EXPO 2018, Gas Turbine Technical Congress & Exposition*, June 11-15, 2018, Oslo, Norway.

"Local and global stability analysis of an academic rotor/stator cavity and their control," *ASME TURBO EXPO 2018, Gas Turbine Technical Congress & Exposition*, June 11-15, 2018, Oslo, Norway.

"Evaluation of integral turbulence scale through the fan stage of a turbofan using hot wire anemometry and large eddy simulation," *ASME TURBO EXPO 2018, Gas Turbine Technical Congress & Exposition*, June 11-15, 2018, Oslo, Norway.

"On the use of periodic boundary condition for large eddy simulation of trailing edge cutback film cooling with internal ribs," *ASME TURBO EXPO 2018, Gas Turbine Technical Congress & Exposition*, June 11-15, 2018, Oslo, Norway.

"Comparison of various CFD codes for LES simulations of turbomachinery: from inviscid vortex convection to multi-stage compressor," *ASME TURBO EXPO 2018, Gas Turbine Technical Congress & Exposition*, June 11-15, 2018, Oslo, Norway.

"ARC versus two-step chemistry and third-order versus second-order numeric schemes for Large Eddy Simulations of the Volvo burner," *AIAA Aerospace Sciences Meeting*, January 8-11, 2018, Kissimmee, Florida, USA.

"Large Eddy Simulation of trailing edge cutback film cooling: Impact of internal stiffening ribs on the adiabatic effectiveness," 7<sup>th</sup> *European Conference for Aeronautics and Aerospace Sciences (EUCASS)*, July 3-6, 2017, Milan, Italy.

\* "Engine scale stability predictions using Large Eddy Simulations", *The 1st international workshop on Near Limit Flames*, July 29-30, 2017, Boston University Photonic Center, Boston, Massachusetts, USA.

"Integrated large eddy simulation of combustor and turbine interactions: effect of turbine stage inlet condition," *ASME TURBO EXPO 2017, Gas Turbine Technical Congress & Exposition*, June 26-30, 2017, Charlotte, North Carolina, USA.

"Sensitivity of large eddy simulations to inflow condition and modeling if applied to a transonic high-pressure cascade vane," *ASME TURBO EXPO 2017, Gas Turbine Technical Congress & Exposition*, June 26-30, 2017, Charlotte, North Carolina, USA.

"Advanced statistical analysis estimating the heat load issued by hot streaks and turbulence on a high-pressure vane in the context of adiabatic large eddy simulations," *ASME TURBO EXPO 2017, Gas Turbine Technical Congress & Exposition*, June 26-30, 2017, Charlotte, North Carolina, USA.

"Comparison of heterogeneous and homogeneous coolant injection models for large eddy simulation of multiperforated liners present in a combustion simulator," *ASME TURBO EXPO 2017, Gas Turbine Technical Congress & Exposition*, June 26-30, 2017, Charlotte, North Carolina, USA.

"Characterization of the surface curvature effect using LES for a single round impinging jet," *ASME TURBO EXPO 2017, Gas Turbine Technical Congress & Exposition*, June 26-30, 2017, Charlotte, North Carolina, USA.

"Large eddy simulations of static and rotating ribbed channels in adiabatic and isothermal conditions," *ASME TURBO EXPO 2017, Gas Turbine Technical Congress & Exposition*, June 26-30, 2017, Charlotte, North Carolina, USA.

\* "Recent applications of Massively parallel Large Eddy Simulations to address Industrial Problems", *HPC Combustion Workshop*, Barcelona Supercomputing Center (BSC-CNS), June 2-4, 2017.

"Heat transfer analysis of a rotating ribbed channel by means of large eddy simulations," *12<sup>th</sup> European Conference on Turbomachinery Fluid dynamics & Thermodynamics*, April 3-7, 2017, Stockholm, Sweden.

"Analysis of a high-pressure multistage axial compressor at off-design conditions with coarse large eddy simulations," *12<sup>th</sup> European Conference on Turbomachinery Fluid dynamics & Thermodynamics*, April 3-7, 2017, Stockholm, Sweden.

"LES of the LS89 cascade: influence of inflow turbulence on the flow predictions," *12<sup>th</sup> European Conference on Turbomachinery Fluid dynamics & Thermodynamics*, April 3-7, 2017, Stockholm, Sweden.

"Comparison of LES and RANS predictions with experimental results of the fan of a turbofan," *12<sup>th</sup> European Conference on Turbomachinery Fluid dynamics & Thermodynamics*, April 3-7, 2017, Stockholm, Sweden.

"Influence of acoustic, chemistry description and wall heat transfer in LES of the Volvo bluff-body stabilized flame dynamics," *AIAA Aerospace Sciences Meeting*, January 9-13, 2017, Grapevine, Texas, USA.

"Large Eddy Simulations of a rotating ribbed channel at high rotation numbers," *11<sup>th</sup> International ERCOFTAC Symposium on Engineering Turbulence Modelling and Measurements*, 21-23 Sep., 2016, Palermo, Italy.

"Wall modeled LES and its impact on rotor / stator cavity unsteady features," *ASME TURBO EXPO 2016, Gas Turbine Technical Congress & Exposition*, June 13-17, 2016, Seoul, South Korea.

"Application of an overset grid method to the large eddy simulation of a high-speed multistage axial compressor," *ASME TURBO EXPO 2016, Gas Turbine Technical Congress & Exposition*, June 13-17, 2016, Seoul, South Korea.

"Variations of anchoring pattern of a bluff-body stabilized laminar premixed flame as a function of the wall temperature," *ASME TURBO EXPO 2016, Gas Turbine Technical Congress & Exposition*, June 13-17, 2016, Seoul, South Korea.

"Large Eddy Simulations of the combustor turbine interface: study of the potential and clocking effects," *ASME TURBO EXPO 2016, Gas Turbine Technical Congress & Exposition*, June 13-17, 2016, Seoul, South Korea.

"LES of a Round Impinging Jet: Investigation of the link between Nusselt secondary peak and near-wall vortical structures," *ASME TURBO EXPO 2016, Gas Turbine Technical Congress & Exposition*, June 13-17, 2016, Seoul, South Korea.

"Analyse aérothermique d'un jet circulaire impactant sur plaque plane à l'aide de la SGE," *Congrès Français de Thermique - SFT*, Toulouse, France, 31 May - 1 June, 2016.

"Influence des conditions aux limites thermiques sur la stabilisation d'une flamme laminaire pr-mélangée," *Congrès Français de Thermique - SFT*, Toulouse, France, 31 May - 1 June, 2016.

"Numerical investigation of combustion noise The Entropy Wave Generator," *22<sup>nd</sup> AIAA/CEAS Aeroacoustics Conference*, 30 May - 1 June, 2016, Lyon, France.

"Integrated Large-Eddy Simulation of Combustion Chamber / Turbine Interactions," *51<sup>st</sup> 3AF International Conference on Applied Aerodynamics*, 4-6 April, Strasbourg, France, 2016.

"Influence of the thermal boundary conditions on the heat transfer of a rib-roughened cooling channel using LES," *11<sup>th</sup> European Turbomachinery Conference - ETC*, Madrid, Spain, March 23-27, 2015.

"Multiphase flow LES study of the fuel split effects on combustion instabilities in an ultra-low NO<sub>x</sub> annular combustor," *ASME TURBO EXPO 2015, Gas Turbine Technical Congress & Exposition*, June 15-19, 2015, Montreal, Canada.

"Assessment of the indirect combustion noise generated in a transonic high-pressure turbine stage," *ASME TURBO EXPO 2015, Gas Turbine Technical Congress & Exposition*, June 15-19, 2015, Montreal, Canada.

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"LES based simulations of combustion noise in a helicopter engine", *Fifteenth International Conference on Numerical Combustion*, Avignon, France, April 19-22, 2015.

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\* "High Performance Computing and Turbulent Reacting Flows: past and potential trends," *Forum ORAP: psécial 20 ans*, Maison de l'UNESCO, Paris, 14-15 Octobre, 2014.

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\* "Towards the complete simulation of compressor, combustion chamber and turbine interactions," *NSF Turbulent Combustion Workshop*, Univ. of Michigan, Ann-Arbor, USA, June 9-10, 2014.

"Large-Eddy Simulation of a high-pressure turbine stage: Effects of sub-grid scale modeling and mesh resolution," *ASME TURBO EXPO 2014, Gas Turbine Technical Congress & Exposition*, June 16-20, 2014, Dusseldorf, Germany.

"LES investigation of Aerodynamics and Aeroacoustics in an axial compressor stage," *ASME TURBO EXPO 2014, Gas Turbine Technical Congress & Exposition*, June 16-20, 2014, Dusseldorf, Germany.

"Numerical and experimental investigation of a combustor simulator dedicated to hot streak generation," *ASME TURBO EXPO 2014, Gas Turbine Technical Congress & Exposition*, June 16-20, 2014, Dusseldorf, Germany.

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\* "Large Eddy Simulation of two phase flow combustion," *MUSAF II*, September 18-20, 2013, Toulouse, France.

"High Performance Computing and CFD: the state-of-the-art technology for jet engine simulations," *CEAS 2013 Air and Space conference*, September 16, 2013, Sweden.

- ★ "Simulations aux Grandes Echelles: instabilités thermo-acoustiques, combustion diphasique et couplages multi-physiques," *XXI Congrès Français de Mécanique*, August 26-30, 2013, Bordeaux, France.
- "Application of Large-Eddy Simulation to rotor/stator configurations," *XXI Congrès Français de Mécanique*, August 26-30, 2013, Bordeaux, France.
- "LES Evaluation of Non-Linear Effects on the Dynamic Flame Response in a Real Gas Turbine Combustion Chamber," *ASME TURBO EXPO 2013, Gas Turbine Technical Congress & Exposition*, June 3-7, 2013, San Antonio, Texas, USA.
- "Large Eddy Simulation of Rotating Ribbed Channel," *ASME TURBO EXPO 2013, Gas Turbine Technical Congress & Exposition*, June 3-7, 2013, San Antonio, Texas, USA.
- "Towards Massively Parallel Large Eddy Simulation of Turbine Stages," *ASME TURBO EXPO 2013, Gas Turbine Technical Congress & Exposition*, June 3-7, 2013, San Antonio, Texas, USA.
- "Experimental and Numerical Analysis of an Ignition Sequence in a Multiple-Injectors Burner," *ASME TURBO EXPO 2013, Gas Turbine Technical Congress & Exposition*, June 3-7, 2013, San Antonio, Texas, USA.
- ★ "Simulation en combustion diphasique turbulente: codes, formation, diffusion chez les industriels, calculs HPC (GENCI, PRACE, INCITE)" *Colloque CFD EquipMeso*, May 16, 2013, CORIA, Rouen, France.
- ★ "Keynote Lecture: High-Performance Computing of turbo machinery unsteady flows" *21st annual conference of the CFD Society of Canada*, May 8, 2013, sherbrooke University, Quebec, Canada.
- "Large Eddy Simulations of the MT1 high-pressure turbine using TurboAVBP" *21st annual conference of the CFD Society of Canada*, May 8, 2013, sherbrooke University, Quebec, Canada.
- ★ "Large Eddy Simulations of Aeronautical Compressible Flows" *VKI Lecture series - Accurate and Efficient Aeroacoustic prediction approaches*, March 25-28, 2013, Rhodes-St-Genève, Belgium.
- ★ "CERFACS state-of-the-art and recent investigations for temperature prediction in turbo-machineries," *GE Global Research Symposium*, June 25-26, 2012, Niskayuna, New York, USA.
- "Steady and Unsteady Modeling for Heat Transfer Predictions of High Pressure Turbine Blade Internal Cooling," *ASME TURBO EXPO 2012, Gas Turbine Technical Congress & Exposition*, June 11-15, 2012, Copenhagen, Denmark.
- ★ "Utilisation de la Simulation aux Grandes Echelles (LES) pour la Prédiction de l'Allumage et la Probabilité d'Allumage dans les Chambres de Combustion," *Journée thématique du GFC: Procédés d'allumage*, IFP-EN, Paris, France, 5 Avril, 2012.
- ★ "Review of HPC use in combustion: France, USA and elsewhere," *3<sup>rd</sup> INCA workshop*, ONERA-CERT, Toulouse, France, November, 2011.
- "Large Eddy Simulation and acoustic studies of azimuthal thermoacoustic modes in annular combustion chambers," *3<sup>rd</sup> INCA workshop*, ONERA-CERT, Toulouse, France, November, 2011.
- "Ignition predictions on non-reacting LES: application and assessment on complex configurations," *3<sup>rd</sup> INCA workshop*, ONERA-CERT, Toulouse, France, November, 2011.
- "LES and Flame Transfer Function measurement in a perfectly premixed swirled burner," *3<sup>rd</sup> INCA workshop*, ONERA-CERT, Toulouse, France, November, 2011.
- "Compressible and incompressible LES of a swirl experimental burner," *3<sup>rd</sup> INCA workshop*, ONERA-CERT, Toulouse, France, November, 2011.
- "Numerical investigation of a helicopter combustion chamber using LES and tabulated chemistry," *3<sup>rd</sup> INCA workshop*, ONERA-CERT, Toulouse, France, November, 2011.
- ★ "Modern developments - LES on real configurations & flameless combustion," *ERCOFTAC SIG28 Course: Flame Stabilisation for Industrial Burners*, GE Global Research Centre, September 26-27, 2011, Munich, Germany.
- ★ "Large Eddy Simulations of Turbulent Reacting Flows for Gas Turbine Combustor Design," *GE Global Research Symposium*, August 15-16, 2011, Niskayuna, New York, USA.
- ★ "Keynote Lecture: turbulent combustion CFD," *2011 European Combustion Meeting*, June 28 - July 1st, 2011, Cardiff, UK.
- "Comparisons of Coupling Strategies for Massively Parallel Conjugate Heat Transfer with Large Eddy Simulation," *IV Int. Conf. on Comp. Methods for Coupled Prbl. in Science and Eng. (Coupled Problems 2011)*, June 20 -22, Kos Island, Greece.
- "Application of RANS and LES to the Prediction of Flows in High Pressure Turbines Components," *ASME TURBO EXPO 2011, Gas Turbine Technical Congress & Exposition*, June 6-11, 2011, Vancou-

ver, Canada.

★ LES Modeling of Combustors - CERFACS Perspective, *ASME TURBO EXPO 2011, Gas Turbine Technical Congress & Exposition*, June 6-11, 2011, Vancouver, Canada.

"Sensitivity of Ignition Sequences to Sparking Time in a Two-phase Flow Industrial Burner," *ERCOFTAC Conference on Highly Resolved Experimental and Numerical Diagnostics for Turbulent Combustion*, Mai 25 -26, Rouen, France.

"Application of RANS and LES to the Prediction of Flows in High Pressure Turbines Components," *AAF, 46<sup>th</sup> Applied Aerodynamics Conference*, March 28-30, 2011, Orléans, France.

"Comparison of RANS Simulation and LES for the Prediction of Heat Transfer in Highly Loaded Turbine Guide Vane," *9<sup>th</sup> European Conference on Turbomachinery (ETC-2010)*, Fluid Dynamics and Thermodynamics, March 21-25, 2011, Istanbul, Turkey.

★ "Recent Contributions of LES to the understanding and the design of Gas Turbines," *British Section Conference of the Combustion Institute*, September 15, 2010, Cambridge, UK.

★ "Multi-Components and Multi-Physics CFD Simulation for the Predictions of Gas Turbine," *ECCOMAS CFD 2010 Conference*, June 14-17, 2010, Lisbonne, Portugal.

"Advanced Numerical Simulation Dedicated to the Prediction of Heat Transfer in a Highly Loaded Turbine Guide Vane," *ASME TURBO EXPO 2010, Gas Turbine Technical Congress & Exposition*, June 14-18, 2010, Glasgow, UK.

"Steady / Unsteady Reynolds Averaged Navier-Stokes and Large Eddy Simulations of a Turbine Blade at High Subsonic Outlet Mach Number," *ASME TURBO EXPO 2010, Gas Turbine Technical Congress & Exposition*, June 14-18, 2010, Glasgow, UK.

"Modelling of the Random Uncorrelated Velocity Stress Tensor for Unsteady Particle Eulerian Simulation in Turbulent Flows," *International Conference on Multiphase Flow 2010 (ICMF-2010)*, May 30 to June 4, 2010, Tampa, Florida, USA.

★ "High Performance Computing of Industrial Flows: Application to Aeronautic and Propulsion Challenges", *Complex Flow Dynamics Workshop*, KAUST, Saudi Arabia, March 22-25, 2010.

★ "Large Eddy Simulations to ease understanding the complex unsteady combustion features of ramjet burners", *Consortium On Computational Combustion For Engineering Applications (COCCFEA) Workshop*, London, United Kingdom, September 17-18, 2009.

"Grid Effects on LES Thermo-Acoustic Limit-Cycle of a Full Annular Aeronautical Engine," *Quality and Reliability of Large-Eddy Simulations*, Pisa, Italy, September 9-11, 2009.

"Massively Parallel Large Eddy Simulation of Combustion in Annular Gas Turbines," *SciDAC 2009*, San Diego, June 14-18, 2009.

★ "High Performance Computing of Industrial Flows: Application to Aeronautic and Propulsion Challenges," *VKI Lecture series - High Performance Computing*, Von Karman Institute, Belgium, June 2009.

"Comparison of Numerical Methods and Combustion Models for LES of a Ramjet Configuration," *2<sup>nd</sup> INCA workshop*, Coria, Rouen, France, October 2008.

"Chemical Modeling and LES Combustion Model Effects on a perfectly Premixed Burner," *2<sup>nd</sup> INCA workshop*, Coria, Rouen, France, October 2008.

"Eulerian and Lagrangian Large Eddy-Simulations of an Evaporating Two-Phase Flow," *2<sup>nd</sup> INCA workshop*, Coria, Rouen, France, October 2008.

"Massively Parallel LES of Annular Gas Turbines," *2<sup>nd</sup> INCA workshop*, Coria, Rouen, France, October 2008.

★ "Prediction of the Ignition Phases in Aeronautical and Laboratory Burners using Large Eddy Simulations," *LES and DNS of ignition process and complex structure flames with local extinction Workshop*, Czestochowa University of Technology, Poland, November 20-21, 2008.

"Large Eddy Simulation of self excited azimuthal modes in annular combustors," *32<sup>nd</sup> Combustion Symposium*, Montreal, Canada, August 3-8, 2008.

★ "Large eddy simulations of turbulent reacting flows in real burners: the status and challenges", *Scientific Discovery Through Advanced Computing (SciDAC) 2008*, Seattle, WA, USA, July 13-17, 2008.

"Massively parallel LES for the design of modern combustors," *8<sup>th</sup> World Congress on Computational Mechanics (WCCM8)* and *5<sup>th</sup> European Congress on Computational Methods in Applied Sciences and Engineering (ECCOMAS 2008)* to confirm, Venice, Italy, June 30- July 5, 2008.

"Large Eddy Simulation of Combustion on Massively Parallel Machines," *8<sup>th</sup> International Meeting on*

*High Performance Computing for Computational Science*, ENSEEIHT, Toulouse, June 24-27, 2008.

\* *Seminar Series at Darmstadt University*: "LES quality and qualification in complex applications," Darmstadt, Germany, May 19, 2008.

\* "Predicting the thermo-acoustic stability of aeronautical gas turbine engines by use of Large Eddy Simulations and Helmholtz solvers," *Consortium On Computational Combustion For Engineering Applications (COCCFEA) Workshop*, Leeds, United Kingdom, April 3-4, 2008.

"Mesh Dependency of Turbulent Reacting Large-Eddy Simulation in a Gas Turbine Combustion Chamber," *Quality and Reliability of Large-Eddy Simulations*, Leuven, Belgium, October 24-26, 2007.

"Azimuthal the Thermo-Acoustic Stability of a Full Gas Turbine Combustion Chamber Using Large-Eddy Simulation," 11<sup>th</sup> *CEAS-ASC Workshop*, Instituto Superior Tecnico, Lisbon, Portugal, September 27-28, 2007.

"Investigating the Thermo-Acoustic Stability of a Real Gas Turbine Combustion Chamber Using Large-Eddy Simulation," 11<sup>th</sup> *CEAS-ASC Workshop*, Instituto Superior Tecnico, Lisbon, Portugal, September 27-28, 2007.

"Acoustic Analysis of Industrial Gas Turbines," *Proceedings of the 11<sup>th</sup> CEAS-ASC Workshop*, Instituto Superior Tecnico, Lisbon, Portugal, September 27-28, 2007.

"Optimization Loop Based on a CFD RANS Code," 25<sup>th</sup> *International Congress of the Aeronautical Sciences - ICAS 2006*, Hamburg, Germany, September 3-8, 2006.

"LES predictions and validations of the exit temperature profile in a industrial combustion chamber," 31<sup>st</sup> *Combustion Symposium*, Heidelberg, Germany, August 6-11, 2006.

"LES of reacting flows," 3<sup>rd</sup> *International Workshop on Rocket Combustion Modeling*, Paris, France, June, 2006.

\* "LES and acoustic analysis of turbulent reacting flows," 44<sup>th</sup> *AIAA Aerospace Sciences Meeting and Exhibit*, Reno, NV, USA, January 9-12, 2006.

"LES predictions and validations of the exit temperature profile in a industrial combustion chamber," *INCA workshop*, Villaroche, France, October 20-21, 2005.

"Automatic Design Optimization Applied to Lean Premixed Combustor Cooling," *INCA workshop*, Villaroche, France, October 20-21, 2005.

"Etude numérique et expérimentale d'une zone de dilution d'une chambre à faible émission polluante," *INCA workshop*, Villaroche, France, October 20-21, 2005.

"Highly Parallel Large Eddy Simulations of Multibranner Configurations in Industrial Gas Turbines," *The Cyprus International Symposium on Complex Effects in Large Eddy Simulations (CY-LES 2005)*, Limassol Cyprus, September 20-25, 2005.

"Large Eddy Simulation predictions and validations of a gas turbine combustion chamber," 17<sup>th</sup> *International Symposium on Airbreathing Engines (ISABE-2005)*, Munich, Germany, September 4-9, 2005.

"Enclosed swirling flows as a bench mark for LES of gas turbine combustors," 1<sup>st</sup> *SFB568/ERCOFTAC-SIG28 workshop on quality assessment of unsteady methods for turbulent prediction and validation*, Darmstadt (Seeheim-Jugenheim), Germany, June 16-17, 2005.

"Experimental and Numerical Investigation of Self-Excited Combustion Oscillations in a Scaled Gas Turbine Combustor," *New Challenges in Aerospace Technology & Maintenance Conference (NCATMC) 2004*, Suntec Singapore International Convention & Exhibition Centre, Singapore, February 20-21, 2004.

"Large Eddy Simulation of Opposed Jets In Cross Flow," 1<sup>st</sup> *International SFB568 Workshop: Trends in Numerical and Physical Modeling for Turbulent Processes in Gas Turbine Combustors*, Technical University of Darmstadt, Germany, November 14-15, 2002.

\* "Large Eddy Simulation for Mixing Enhancement in Gas Turbine Designs," *Department of Mechanical Engineering*, University of Pittsburgh, PA, USA, September 17, 2002.

"Velocity Filtered Density Function for Large Eddy Simulation of Turbulent of turbulent Mixing Layer," 3<sup>rd</sup> *AFOSS International Conference on DNS/LES (TAICDL)*, University of Texas at Arlington, Arlington, TX, USA, August 6, 2001.

"PDF methods for large eddy simulation of turbulent reactive flows," *IUTAM Symposium on Turbulent Mixing and Combustion*, Queen's University at Kingston, Canada, June 5, 2001.

"Velocity Filtered Density Function for Large Eddy Simulation of Turbulent Flows," 53<sup>rd</sup> *Annual Meeting of the Division of Fluid Dynamics of the American Physical Society*, Washington, DC, USA, November 20, 2000.

- ★ "Velocity Filtered Density Function for Large Eddy Simulation of Turbulent Flows," *Jet Propulsion Laboratory (NASA/Cal Tech)*, Pasadena, Ca, 91109, USA, October 30, 2000.
- ★ "Stochastic modeling of the sub-grid quantities for LES of turbulent reacting flows," *Department of Mechanical & Aerospace Eng.*, SUNY at Buffalo, Buffalo, NY, 142260-4400, USA, October 25, 2000.
- ★ "The Velocity Filtered Density Function method for LES of turbulent flows", *Department of Mechanical & Aerospace Eng.*, SUNY at Buffalo, Buffalo, NY, 142260-4400, USA, April 20, 2000.
- ★ "Validation of the Filtered Density Function of Velocity for Large Eddy Simulation of Turbulent flows," *Sibley School of Mechanical and Aerospace Eng.*, Cornell University, Ithaca, NY, 14853, USA, October 22, 1999.
- "Large Eddy Simulation of Gravitational Effects on Transitional and Turbulent Gas-Jet Diffusion Flame," *Fifth International Microgravity Combustion Workshop*, Cleveland, OH, USA, May 19, 1999.
- ★ "The stochastic approach to the Large Eddy Simulation closure problem of turbulent reacting flows," *Department of Mechanical & Aerospace Eng.*, SUNY at Buffalo, Buffalo, NY, 142260-4400, USA, February 11, 1999.
- "Filtered Density Function of Velocity for Large Eddy Simulation of Turbulent Flows," *51st Annual Meeting of the Division of Fluid Dynamics of the American Physical Society*, Philadelphia, PA, USA, November 24, 1998.
- "Consistency issues regarding VFDF methods and second order closure methods for LES," *Thousand Islands Fluids Meeting*, Kingston, ON, April 19, 1998.
- ★ "Explicit algebraic turbulence closures in LARCK," *Department of Mechanical & Aerospace Eng.*, SUNY at Buffalo, Buffalo, NY, 142260-4400, USA, February 12, 1998.
- "Explicit algebraic turbulence closures in LARCK," *AIAA Northeast Regional Student Conference*, Syracuse, NY, USA, April 15, 1996.