

## Section A. PERSONAL DATA

Name and Surname	Oriol Lehmkuhl Barba		
DNI	47719120P	Age	37
Researcher's identification number	Researcher ID		
	Scopus Author ID		
	ORCID	0000-0002-2670-1871	

### A.1. Current professional situation

Institution	Barcelona Supercomputing Center		
Dpt. / Centre			
Address			
Phone	93 405 4289	Email	<a href="mailto:orioldsi@gmail.com">orioldsi@gmail.com</a>
Professional category	Postdoctoral Researcher	Start date	2016
UNESCO spec. code			
Keywords			

### A.2. Academic education (Degrees, institutions, dates)

Bachelor/Master/PhD	University	Year
Doctor por la Universitat Politècnica de Catalunya	Universitat Politècnica de Catalunya	2012
Ingeniero Industrial	Universitat Politècnica de Catalunya	2006

### A.3. General quality indicators of scientific production

Fecha de aplicación: 7/01/2019

h-index (Scopus) : 17

Citations (Scopus) : 817 total

citations Most cited document

(Scopus): 73 cites

Total journal publications (Scopus): 50 (15 on 10%)

1. Q1 journal publications : 46

2. Q2 journal publications : 3

3. Q3 journal publications : 1

Total contributions on international peer reviewed conferences: 182

## Section B. SUMMARY OF THE CURRICULUM

Dr. Oriol Lehmkuhl Barba holds a PhD in Mechanical Engineering (UPC, 2012). PDJ 2014 post-doc researcher by AGAUR (Generalitat de Catalunya) at UPC from 2015 to 2016. He is senior researcher at the Department of Computer Applications in Science and Engineering (CASE) of Barcelona Supercomputer Center (BSC) since 2016. His main research interests are related to turbulence modelling, multi-phase modelling, high-performance computing, multi-physics & multi-scale modelling, aerodynamic simulations and bio-mechanical modelling. He has been the co-director 10 PhD theses (four of them on-going) and 2 master theses, is author of 50 papers in JCR journals (h-index 17), with 182 contributions to peer-reviewed international conferences and 4 patents. As a result of this research activity Dr. Lehmkuhl has built a strong research

network including different Universities (i.e Stanford University, University of Stuttgart, University of Southampton, Queen's University, etc.), research institutes (i.e Center of Turbulence Research, Keldysh Institute of Applied Mathematics, etc.) and companies (i.e Alstom Wind, Envision Energy, Total, Gas Natural, Scnema, Liebherr, Abengoa Solar, Fagor, HP, Seat, etc.). In addition, Dr. Lehmkuhl has been involved in 18 national and EU financially supported projects focused on the development of HPC CFD codes (FP6, FP7, H2020 and CleanSky) and has been participant of 25 High Performance Computing research projects of the Spanish Supercomputer Network (RES), 4 Tier-0 PRACE HPC projects and 1 INCITE project at Argonne.

Moreover, he is co-founder of Termo Fluids S.L. ([www.termofluids.com](http://www.termofluids.com)) a startup of UPC and was CEO of the company until 2015. This company was created in 2006 with the main objective of providing engineering services to different industries using HPC platforms. In that sense, he was leading the software development of the TermoFluids CFD platform from 2006 to 2016. TermoFluids is currently being used by different entities in R&D activities where high-fidelity simulations are a must. At the moment of selling the company (2016), 10 employees were hired and several European and national projects were being contracted using Dr. Lehmkuhl core technology.

Since 2016, Dr. Lehmkuhl has been working at BSC as post-doctoral researcher leading the turbulence modelling research line in CASE. At this time, he is the main PI of one R&D competitive National Project focused on high fidelity methods for the simulation of aircrafts, he is participating in one INCITE project in collaboration with Prof. P. Moin at Stanford University and in two H2020 CleanSky2 projects (one of them as PI). Moreover, he has been PI of a R&D private contract with the company Vortex Bladeless S.L. to design an innovative wind turbine by means of advanced simulation technologies, PI of two R&D private contract with the company SEAT to research in wheel hub geometry impact on the car aerodynamics, PI of 3 research projects in the RES and participated in 5 more RES projects and PI of a Tier-0 PRACE project to research in vortex-induced-vibrations at high Reynolds. During this period, Dr. Lehmkuhl has published 16 JCR papers. Additionally, he is co-directing 4 PhD students at BSC in the subjects of turbulence and multi-phase modelling.

## **Section C. MOST RELEVANT MERITS (ordered by typology)**

### **C.1. Publications (15 most relevant publications)**

1. **Scientific paper**. JC Cajas; et al. (13/9). 2018. Fluid-Structure Interaction Based on HPC Multicode Coupling SIAM Journal of Scientific Computing. Society for Industrial and Applied Mathematics. 40-6, pp.677-703. ISSN 1064-8275.
2. **Scientific paper**. A; et al. (6/2). 2018. A semi-implicit coupling technique for fluid-structure interaction problems with strong added-mass effect Journal of Fluids and Structures. Elsevier. 80, pp.94-112. ISSN 0889-9746.
3. **Scientific paper**. I. Rodríguez; et al. (6/2). 2017. LES-based Study of the Roughness Effects on the Wake of a Circular Cylinder from Subcritical to Transcritical Reynolds Numbers Flow, Turbulence and Combustion. Springer Netherlands. 99-3-4, pp.729-763. ISSN 13866184.
4. **Scientific paper**. J. Ventosa; et al. (4/2). 2017. Large Eddy Simulation of a Turbulent Diffusion Flame: Some Aspects of Subgrid Modelling Consistency Flow, Turbulence and Combustion. Springer Netherlands. 99-1, pp.209-238. ISSN 1386-6184.
5. **Scientific paper**. Báez Vidal, A.; et al. (4/2). 2016. On the properties of discrete spatial filters for CFD Journal of Computational Physics. Academic Press Inc.. 326, pp.474-498. ISSN 0021-9991.

6. **Scientific paper.** Balcázar, N.; et al. (4/2). 2015. A multiple marker level-set method for simulation of deformable fluid particles International Journal of Multiphase Flow. Elsevier BV. 74, pp.125-142. ISSN 0301-9322.
7. **Scientific paper.** Aljure, D.E.; et al. (5/3). 2015. Influence of rotation on the flow over a cylinder at Re=5000 International Journal of Heat and Fluid Flow. Elsevier. 55, pp.76-90. ISSN 0142-727X.
8. **Scientific paper.** Jofre, L.; et al. (4/3). 2015. Parallel load balancing strategy for Volume-of-Fluid methods on 3-D unstructured meshes Journal of Computational Physics. Academic Press Inc.. 282, pp.269-288. ISSN 0021-9991.
9. **Scientific paper.** Balcázar, N.; et al. (5/3). 2014. A finite-volume/level-set method for simulating two-phase flows on unstructured grids International Journal of Multiphase Flow. Elsevier BV. 64, pp.55-72. ISSN 0301-9322.
10. **Scientific paper.** Trias, F.X.; et al. (5/2). 2014. Symmetry-preserving discretization of Navier-Stokes equations on collocated unstructured grids Journal of Computational Physics. Academic Press Inc.. 258, pp.246-267. ISSN0021-9991.
11. **Scientific paper.** Lehmkuhl, O.; et al. (5/1). 2014. Unsteady forces on a circular cylinder at critical Reynolds numbers Physics of fluids. 26, pp.125110-1-125110-22. ISSN 1070-6631.
12. **Scientific paper.** Rodríguez, I.; et al. (4/2). 2013. Direct numerical simulation of a NACA0012 in full stall International Journal of Heat and Fluid Flow. Elsevier. 43, pp.194-203. ISSN 0142-727X.
13. **Scientific paper.** Lehmkuhl, O.; et al. (4/1). 2013. Low-frequency unsteadiness in the vortex formation region of a circular cylinder Physics of fluids. 25-8, pp.085109-085109-21. ISSN 1070-6631.
14. **Scientific paper.** Rodriguez, I.; et al. (5/3). 2011. Direct numerical simulation of the flow over a sphere at Re = 3700 Journal of Fluid Mechanics. Cambridge University Press. 679, pp.263-287. ISSN 0022-1120.
15. **Scientific paper.** Borrell, R.; et al. (4/2). 2011. Parallel direct Poisson solver for discretisations with one Fourier diagonalisable direction Journal of Computational Physics. Academic Press Inc.. 230-12, pp.4723-4741. ISSN 0021-9991.

## C.2. Participation in R&D and Innovation projects

1. MG-3-1-2018, High-Fidelity LES/DNS Data For Innovative Turbulence Models European Commission. H2020. O Lehmkuhl. (Barcelona Supercomputing Center). 01/04/2019- 01/04/2022. 240.000 €. Principal investigator.
2. TRA2017-88508-R, THINAIR: Towards High-fidelity methodologies for INnovative AIRcraft design Ministerio de Economía, Industria y Competitividad. O Lehmkuhl. (Barcelona Supercomputing Center). 01/01/2018-31/12/2021. 108.416€.
3. ESTiMatE - Emissions SooT ModEl European Commission. Clean Sky 2. O Lehmkuhl. (Barcelona Supercomputing Center). 01/11/2018- 31/10/2021. 1.799.875 €. Principal investigator.
4. INFRAEDI-02-2018, EXCELLERAT- The European Centre Of Excellence For E gineering Applications H2020. (Barcelona Supercomputing Center). 01/11/2018- 31/10/2021. 590.375 €. Team member.
5. H2020-CS2-CFP06-2017-01, FireExtinction - Multi-Physics methodology for phase change due to rapidly depressurised two-phase flows European Commission. Horizon 2020 - Research and Innovation Framework Programme. D Mira. (Barcelona Supercomputing Center). 01/03/2018-29/02/2020. 395.937,5 €. Team member.
6. FP7-620129-EFFAN, EFFAN - Efficient Fan European Comission. CleanSky. O Lehmkuhl. (TERMO FLUIDS, S.L). 01/02/2014-30/09/2016. 107.587 €. Principal investigator.

7. ENERGY STORAGE.EIT/KIC InnoEnergy/FPA/1, Energy Storage as necessary part of energy balanced buildings and districts European Institute For Innovation And Technology. Knowledge Innovation Communities. O Lehmkuhl. (TERMO FLUIDS, S.L). 01/01/2011- 31/12/2015. 100.000 €. Principal investigator.
8. C06650, Development of a computational fluid dynamics software CENTRO DE INFORMACION Y DESARROLLO EMPRESARIAL -CIDEM-. O Lehmkuhl. (TERMO FLUIDS S.L. ,2007-2009. 84.000 €. Principal investigator.

#### **C.4. Patents**

1. Assensi Oliva et al. PCT/ES/2014/070468. Máquina de absorción refrigerada por aire. Spain. 16/12/2014. Universitat Politècnica de Catalunya. TERMO FLUIDS, S.L.
2. Assensi Oliva et al. PCT/ES2014/070400. Acumulador de energía térmica en base a materiales de cambio de la fase sólido-líquido y método de fabricación de la unidad. Spain. 14/05/2014. Universitat Politècnica de Catalunya.
3. Assensi Oliva et al. PCT/ES2013/070889. Sistema de almacenamiento de energía térmica combinando material sólido de calor sensible y material de cambio de fase. Spain. 27/12/2012. Universitat Politècnica de Catalunya.
4. Oriol Lehmkuhl et al.. EP2522927A2. Solar thermal collector with transparent insulation. Spain. 14/12/2012. TERMO FLUIDS, S.L.

#### **C.5. Scientific, technical and/or assessment committees**

1. Management Committee - SimInhale COST Action MP1404, European Union, COST, 2015-2019.
2. Institution representative at ERCOFTAC Association, European Union.

#### **C.6. Organization of R&D activities (most relevant)**

1. ICCFD10 INTERNATIONAL CONFERENCE ON COMPUTATIONAL FLUID DYNAMICS, Type of activity: International Conference, Type of participation: Organizer, 09/07/2018 - 13/07/2018.

#### **C.7. Experience supervising doctoral thesis and/or final year projects (last 3 PhD students)**

1. Parallel object-oriented algorithms for simulation of multiphysics. Application to thermal systems. Doctoral thesis, Student: Joan Lopez, Co-director of thesis: O Lehmkuhl; Q Rigola; A Oliva, Obtained qualification: Excelente Cum Laude, Entity: Universitat Politècnica de Catalunya, Date of reading: 05/02/2016
2. Numerical simulation of turbulent diffusion flames using flamelet models on unstructured meshes. Application to thermal systems. Doctoral thesis, Student: Jordi Ventosa, Co-director of thesis: O Lehmkuhl; CD Perez-Segarra; A Oliva, Obtained qualification: Excelente Cum Laude, Entity: Universitat Politècnica de Catalunya, Date of reading: 02/10/2015
3. Numerical Modeling of Complex Heat Transfer Phenomena in Cooling Applications. Application to thermal systems. Doctoral thesis, Student: Xiaofei Hou, Co-director of thesis: O Lehmkuhl; Q Rigola; A Oliva, Obtained qualification: Excelente Cum Laude, Entity: Universitat Politècnica de Catalunya, Date of reading: 22/06/2015