

## Curriculum Vitae

### Juan Pedro Mellado González

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#### EDUCATION

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- 2001 – 2004 **Doctor of Philosophy** in Engineering Sciences (Aerospace Engineering).  
Department of Mechanical and Aerospace Engineering, University of California, San Diego.  
Research on turbulence and computational fluid dynamics, thesis *“Large eddy simulation of variable density flows”* focused on jets, Rayleigh-Taylor turbulence, and nonpremixed combustion.
- 1999 – 2001 **Master of Science** in Engineering Sciences (Aerospace Engineering).  
Department of Mechanical and Aerospace Engineering, University of California, San Diego.
- 1993 – 1999 **Bachelor of Science** in Aeronautical Engineering.  
School of Aeronautical Engineering, Polytechnic University of Madrid.

#### PROFESSIONAL EXPERIENCE

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- 04.2019 – **Full Professor**, Department of Physics, Aerospace Engineering Division, Universitat Politècnica de Catalunya, Barcelona.
- 08.2010 – **Max Planck Research Group Leader**, Max Plank Institute for Meteorology, Hamburg.  
Group *Turbulent Mixing Processes in the Earth System* studying small-scale boundary-layer processes and their coupling to large-scale properties, using theory and high-resolution simulations.
- 04.2007 – 07.2010 **Scientific Researcher**, Institute for Combustion Technology, RWTH Aachen University.  
Research on shear- and buoyancy driven turbulent flows, external intermittency, density effects in turbulent jets, and moist convection at stratocumulus tops.
- 04.2006 – 03.2007 **Project Engineer**, European Space Operations Center, ESA, Darmstadt.  
Contractor for GMV in the OPS/GFA Division. Work on launch vehicle optimization and mission analysis (transfer trajectories to libration equilibrium points, and orbits around them).
- 03.2005 – 01.2006 **Assistant Professor**, Department of Aerospace Engineering, University of Sevilla.
- 05.2004 – 12.2004 **Post-doctoral fellow**, Turbulence Simulation Group, Technical University of Munich.  
Research on non-premixed turbulent combustion and subgrid-scale modeling.
- 10.1999 – 07.2002 **Research Assistant**, Department of Mechanical and Aerospace Engineering, University of California, San Diego.
- 10.1998 – 06.1999 **Internship**, Department of Motopropulsion and Thermofluidmechanics of the School of Aeronautical Engineering, Polytechnic University of Madrid.  
Simulation of the thermodynamic cycle in reciprocating engines and unstructure mesh generation for supersonic flows.
- 07.1998 – 09.1998 **Trainee**, von Karman Institute for Fluid Dynamics.  
Development of a chemical kinetics model for simulations of inductive plasma torches.
- 07.1997 – 09.1997 **Trainee**, Astrophysics Institute of the Canary Islands.  
Design of a test bench for small step-by-step motors used in infrared cameras of telescopes.

## TEACHING EXPERIENCE

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- 2012 **Introduction to Turbulence**, Max Planck Institute for Meteorology.  
– 2018 An introduction to fundamental concepts and analysis tools of turbulence, for PhD students.
- 2008 **Introduction to Combustion**, RWTH Aachen University.  
– 2009 An introduction to premixed and non-premixed combustion, for master students.
- 2005 **Propulsion Systems**, University of Sevilla.  
An introduction to airbreathing and rocket engines, for undergraduate students.
- 2002 **C/C++ Programming**, University of California, San Diego.  
An introduction to general programming skills and C language, for undergraduate students.

## DOCTORAL SUPERVISION

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Katherine Fodor (11.2016–), Bernhard Schulz (11.2015-04.2019), Armin Haghshenas (10.2015-04.2019), Cedrick Ansorge (04.2012-01.2016), Thomas Keitzl (05.2012-11.2015), Jade Rachele Garcia (02.2011-06.2014).

## POST-DOCTORAL SUPERVISION

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Dr. Alberto de Lozar (currently at the German Weather Service), Dr. Chiel van Heerwaarden (currently at U. Wageningen), Dr. Mona Karimi (currently at NASA Ames).

## FUNDING

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- 10.2016 **German Research Foundation, 193 k EUR**  
– 09.2019 First phase of the DFG priority programme 1881 Turbulent Superstructures, project *Convection Cells in the Planetary Boundary Layer: Origin and Reduced Modeling*.
- 11.2010 **Max Plank Society for the Advancement of Science, 2.1 M EUR**  
– Development of the Max Planck Research Group *Turbulent Mixing Processes in the Earth System*.
- 11.2010 **John von Neumann Institute for Computing, 250 million core-hours.**  
– Computational time at Jülich Supercomputing Centre, project *Direct Numerical Simulation of Turbulent Mixing in the Planetary Boundary Layer*.
- 07.2011 **German Research Foundation, 11.4 k EUR**  
– 07.2014 Third phase of the DFG priority programme 1276 Metström, project *Analysis and Numerical Simulation of Stratocumulus Clouds*.
- 07.2009 **German Climate Computing Center, 6.9 million core-hours.**  
–12.2013 Computational time for project *Direct Numerical Simulation of Climate Relevant Cloud Mixing Processes*.

## SELECTED PUBLICATIONS

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- J. P. Mellado, 2017: *Cloud-top entrainment in stratocumulus clouds*, Annu. Rev. Fluid Mech., 49, 145-169.
- C. Ansorge and J. P. Mellado, 2014: *Global intermittency and collapsing turbulence in a stratified planetary boundary layer*, Boundary-Layer Meteorol., 153, 89-116.
- C. C. van Heerwaarden, J. P. Mellado and A. de Lozar, 2014: *Scaling laws for the heterogeneously heated free convective boundary layer*, J. Atmos. Sci., 71, 3975-4000.
- J. P. Mellado, 2012: *Direct numerical simulation of free convection over a heated plate*, J. Fluid Mech., 712, 418-450.
- J. P. Mellado, 2010: *The evaporatively-driven cloud-top mixing layer*, J. Fluid Mech., 660, 5-36.
- J. P. Mellado, L. Wang and N. Peters, 2009: *Gradient trajectory analysis of a scalar field with external intermittency*, J. Fluid Mech., 626, 333-365.