Curriculum Vitae

# Juan Pedro Mellado González

Department of Physics, Aerospace Engineering Division, Universitat Politècnica de Catalunya

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## Education

2001 – 2004 **Doctor of Philosophy** in Engineering Sciences (Aerospace Engineering).
Department of Mechanical and Aerospace Engineering, University of California, San Diego.

1999 – 2001 **Master of Science** in Engineering Sciences (Aerospace Engineering).
Department of Mechanical and Aerospace Engineering, University of California, San Diego.

1993 – 1999 **Bachelor and Master of Science** in Aeronautical Engineering.
School of Aeronautical Engineering, Polytechnic University of Madrid.

## Professional Experience

04.2019 – **Full Professor**, Department of Physics, Aerospace Engineering Division, Universitat Politècnica de Catalunya, Barcelona.

08.2010 – 03.2019 **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 – 04.2004 **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

Aerospace Technology (2020-), Numerical Methods (2019-), Turbulence (2012-), Combustion (2008-2009), Propulsion (2005), C/C++ Programming (2002).

## Doctoral Supervision

Katherine Fodor (11.2016-04.2020), 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

Dr. Alberto de Lozar (2011-2016, currently at the German Weather Service), Dr. Chiel van Heerwaarden (2011-2015, currently at U. Wageningen), Dr. Mona Karimi (2016-2018, currently at NASA Ames).

## Funding

11.2010 – 10.2019 **Max Plank Society for the Advancement of Science, 2.9 M EUR**
Development of the Max Planck Research Group *Turbulent Mixing Processes in the Earth System*.

11.2016 – 10.2019 **German Research Foundation, 193 k EUR**
First phase of the DFG priority programme 1881 Turbulent Superstructures, project *Convection Cells in the Planetary Boundary Layer: Origin and Reduced Modeling*.

11.2010 –10.2019 **John von Neumann Institute for Computing, 250 million core-hours**.
Computational time at Jülich Supercomputing Centre, project HHH07 *Direct Numerical Simulation of Turbulent Mixing in the Planetary Boundary Layer*.

07.2011 – 06.2014 **German Research Foundation, 11.4 k EUR**
Third phase of the DFG priority programme 1276 Metström, project *Analysis and Numerical Simulation of Stratocumulus Clouds*.

07.2009 –12.2013 **German Climate Computing Center, 6.9 million core-hours**.
Computational time for project 573 *Direct Numerical Simulation of Climate Relevant Cloud Mixing Processes*.

## Selected Publications


J. P. Mellado, 2017: *Cloud-top entrainment in stratocumulus clouds*, Annu. Rev. Fluid Mech., 49, 145-169.

J. P. Mellado, C. S. Bretherton, B. Stevens and M. C. Wyant, 2018: *DNS and LES for simulating stratocumulus: Better together*, J. Adv. Model. Earth Syst., 10, 1421-1438.

C. Ansorge and J. P. Mellado, 2016: *Analyses of external and global intermittency in the logarithmic layer of Ekman flow*, J. Fluid Mech., 805, 611-635.

C. C. van Heerwaarden and J. P. Mellado, 2016: *Growth and decay of a convective boundary layer over a surface with a constant temperature*, J. Atmos. Sci., 73, 2165-2177.

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.