

# Alberto Cuadra Lara

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## Work Experience

Jul 2019 - **Pre-doctoral researcher in Fluid Mechanics**, Fluid Mechanics Group, Universidad Carlos III de Madrid, Spain. Advisors: Marcos Vera & César Huete

Mar 2019 - Jun 2019 **Research Technician in Fluid Mechanics**, Fluid Mechanics Group, Universidad Carlos III de Madrid, Spain. Advisors: Marcos Vera

Oct 2018 - Jan 2019 **M.Sc research assistant**, Fluid Mechanics Group, Universidad Carlos III de Madrid, Spain. Advisors: Marcos Vera

## Education

Jul 2019 - Dec 2022 **Ph.D. in Fluid Mechanics, Universidad Carlos III de Madrid**

Sept 2017 - Feb 2019 **M.Sc. Applied Mathematics, Universidad Carlos III de Madrid**  
Thesis title: Development of a thermochemical code with teaching and research applications. GPA: 3.68/4.0

Oct 2011 - Jul 2017 **B.Sc. Industrial Technologies Engineering, Universidad de Málaga**  
Thesis title: Numerical study of a diffusion flame with axial co-flow using ANSYS Fluent. GPA: 3.08/4.0

## Fellowships

Oct 2017 - Jan 2018 **M.Sc Research Assistant Fellowship**, Universidad Carlos III de Madrid

Sept 2016 - Dec 2016 **Study-stay under Convocatoria Iberoamérica**, Ministerio de Educación, Spain.  
Destination: Instituto Tecnológico y de Estudios Superiores de Monterrey, Mexico. GPA: 3.58/4.0

Oct 2014 - Jul 2015 **Study-stay under ERASMUS +**, Ministerio de Educación, Spain.  
Destination: Universitatea Politehnica din București, Romania. GPA: 3.39/4.0

## Languages

English: Fluent  
Spanish: Mother tongue

## Publications

### Journal Articles

- Huete, C., **Cuadra, A.**, Vera, M., & Urzay, J. (2021). Thermochemical effects on hypersonic shock waves interacting with weak turbulence. *Physics of Fluids* 33, 086111 (2021) (featured article). <https://doi.org/10.1063/5.0059948>
- Cuadra, A.**, Huete, C., & Vera, M. (2020). Effect of equivalence ratio fluctuations on planar detonation discontinuities. *Journal of Fluid Mechanics*, 903, A30. <https://doi.org/10.1017/jfm.2020.651>

### Relevant Code contribution

- Cuadra, A.**, Huete, C., & Vera, M. (2021). Combustion Toolbox: A MATLAB-GUI based open-source tool for solving combustion problems. (v0.3.74). Zenodo. <https://doi.org/10.5281/zenodo.5599436>.

### Conference contribution

- Cuadra, A.**, Huete, C., Vera, M., & Urzay, J. (2021). Theory of turbulence augmentation across hypersonic shock waves. In 74th Annual Meeting of the Division of Fluid Dynamics (APS DFD), Phoenix, U.S.A.




2. **Cuadra, A.**, Huete, C., & Vera, M. (2021). Effect of fuel mass fraction heterogeneity on the detonation propagation speed. In 25th International Congress of Theoretical and Applied Mechanics (ICTAM), Milano, Italy.
3. Huete, C., **Cuadra, A.**, & Vera, M. (2019). Stability of non-adiabatic shock waves. In 27th International Colloquium on the Dynamics of Explosions and Reactive Systems (ICDERS), Beijing, China.
4. **Cuadra, A.**, & Vera, M. (2019). Development and validation of a new MATLAB®/GUI based thermochemical code. In 11th International Mediterranean Combustion Symposium (MSC), Tenerife, Spain.
5. **Cuadra, A.**, & Vera, M. (2019). Development of a GUI-based thermochemical code with teaching and research. In 1st Colloquium of the Spanish Theoretical and Applied Mechanics Society (STAMS), Madrid, Spain.
6. Huete, C., Melendez, A., **Cuadra, A.**, Sánchez, J., & Vera, M. (2018). Simulación del efecto de ondas expansivas sobre estructuras porticadas. In 6th Congreso Nacional de I+D en Defensa y Seguridad, Valladolid, Spain.

### Seminars & Workshops

1. **Cuadra, A.**, Huete, C. & Vera, M. (2021). Development of an open-source thermochemical code: Fundamentals and application to shock turbulence interaction problems in the hypersonic regime. Seminar presented as part of the PhD Programme in Mechatronics Engineering, Málaga, Spain.
2. **Cuadra, A.**, Huete, C. & Vera, M. (2019). Turbulence generation by planar detonations in heterogeneous mixtures. In Workshop on Fluid Mechanics, Granada, Spain.

### Teaching



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2019 - 2022		<b>Aero-thermochemistry</b> (Lab sessions)	Universidad Carlos III de Madrid
2019 - 2022		<b>Explosion Dynamics</b> (Lab sessions)	Centro Universitario de la Guardia Civil
2019 - 2022		<b>Fluid Mechanics</b> (Lab sessions)	Universidad Carlos III de Madrid

### Student Advising

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#### B.Sc level

2021 - 2022		1-end-of-degree projects	Universidad Carlos III de Madrid
2019 - 2020		1-internship projects	Universidad Carlos III de Madrid Sending: ENSTA Bretagne, France