

# Alberto Cuadra Lara



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## Work Experience

|                     |   |
|---------------------|---|
| Jul 2019 -          | <b>Pre-doctoral researcher in Fluid Mechanics</b> , Fluid Mechanics Group, Universidad Carlos III de Madrid, Spain. Advisors: Marcos Vera & César Huete |
| Mar 2019 - Jun 2019 | <b>Research Technician in Fluid Mechanics</b> , Fluid Mechanics Group, Universidad Carlos III de Madrid, Spain. Advisors: Marcos Vera                   |
| Oct 2018 - Jan 2019 | <b>M.Sc research assistant</b> , Fluid Mechanics Group, Universidad Carlos III de Madrid, Spain. Advisors: Marcos Vera                                  |

## Education

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|----------------------|--|
| Jul 2019 - Dec 2022  | <b>Ph.D. in Fluid Mechanics, Universidad Carlos III de Madrid</b>  |
| Sept 2017 - Feb 2019 | <b>M.Sc. Applied Mathematics, Universidad Carlos III de Madrid</b><br>Thesis title: Development of a thermochemical code with teaching and research applications. GPA: 3.68/4.0    |
| Oct 2011 - Jul 2017  | <b>B.Sc. Industrial Technologies Engineering, Universidad de Málaga</b><br>Thesis title: Numerical study of a diffusion flame with axial co-flow using ANSYS Fluent. GPA: 3.08/4.0 |

## Fellowships

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| Oct 2017 - Jan 2018  | <b>M.Sc Research Assistant Fellowship</b> , Universidad Carlos III de Madrid   |
| Sept 2016 - Dec 2016 | <b>Study-stay under Convocatoria Iberoamérica</b> , Ministerio de Educación, Spain.<br>Destination: Instituto Tecnológico y de Estudios Superiores de Monterrey, Mexico. GPA: 3.58/4.0 |
| Oct 2014 - Jul 2015  | <b>Study-stay under ERASMUS +</b> , Ministerio de Educación, Spain.<br>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.

## 5.1 Seminars & Workshops

1. **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

### B.Sc level

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|-------------|---|--------------------------|----------------------------------|
| 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  |