CARLOS D. MORA MORENO

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Delivering new technologies in benefit of the society is my passion. My experience as a researcher in industry and academia has prepared me to react to the technological challenges facing the digital age. I manage a project focusing on the development of predictive models to better understand and improve a sustainable energy solution. My most recent results explain a decade-long problem about geometric constraints.

Values:	Reliability, transcendence, innovation and pursuit of excellence, responsibility, respect, personal development
Competencies:	Analytical mind, attention to detail, leadership, proactivity, persistency, reliability, multiculturality

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Nationality:	Mexican
Date of birth:	20/09/1990

EXPERIENCE

2017 - present

Ph.D. Candidate at Eindhoven University of Technology

- **Main project:** Development of mathematical models to predict and reduce heat transport in fusion plasma reactors
- **Skills / duties:**
  - Perform 5-D numerical simulations in high performance computers
  - Program data analysis routines using modern languages
  - 'Big data' approach for analysis of terabytes of turbulence simulations
  - Build models, then test and validate their performance
  - Deliver engaging presentations
  - Write research proposals and reports
  - Prepare novel scientific publications
  - Manage multi-national collaborative tasks 2017

Research Associate at UK Atomic Energy Authority

- **Main project:** Develop experimental scenarios to test the capabilities of a new magnetic coil configuration of a fusion plasma reactor
- **Skills / duties:**
  - Solve 2-D magnetic equilibrium equations using a dedicated MATLAB package
  - Calculate magnetic coil interaction matrices
  - Devise the transitions between magnetic equilibria
  - Determine the viability of experimental scenarios
- Experiments ran successfully during device commissioning

2015 - 2016 **Diagnostics Engineer at TAE technologies and spin-off Plasmatech**

- **Main project:** Characterisation of impurity losses in a linear plasma device using Doppler spectroscopy
- **Skills / duties:**
  - Hands-on maintenance of experimental setup
  - Development of data acquisition routines
  - Support to lead scientists during experimental campaigns
  - Involvement in discussion of physical results
  - Experience in a multi-physics, engineering and industrial environment
  - Result: Thesis on the main project

EDUCATION

2017 - present (est. May 2022) **Ph.D. in Applied Physics**

Eindhoven University of Technology · Max Planck Institute for Plasma Physics

- Specialisation in Science and Technology of Nuclear Fusion
- In collaboration with the institute hosting the most advanced device of its type: Wendelstein 7-X
- Followed soft-skills training courses about communication, scientific integrity, project managing, writing workshops, and student supervision

2016 - 2017 **Master of Science (with distinction) in Fusion Energy**

University of York · UK Atomic Energy Authority

- Specialisation program to address the current energy demand with an innovative solution: Nuclear Fusion
- Focus on theoretical plasma physics and HPC computing
- One-year program with focus on research experience
- Awarded a scholarship from the Mexican Science and Technology Council

2014 **International exchange experience**

Universitat Autònoma de Barcelona

- Six months exchange program
- Followed courses:
  - Particle physics
  - Business organisation and management
  - Entrepreneurship

2009 - 2012 **Bachelor of Engineering Physics**

Universidad Autónoma Metropolitana - Azcapotzalco

- Assistant at the local plasma laboratory
- International exchange scholarship
- End-project scholarship

TEACHING EXPERIENCE

2015 - 2019 **Student supervision**

- Master thesis on plasma turbulence in stellarators
- Bachelor end-projects on turbulence saturation mechanisms in stellarators

SKILLS

Languages

Spanish	★★★★★
English	★★★★★
Italian	★★★★☆
Dutch	★★★½☆

Computer

- **Linux** · Preferred operating system (Suse)
- **Vim** · Preferred editor
- **LaTeX** · Publication-quality documents
- **Bash, Make, ...** · Daily scripting and development
- **Microsoft Office** · Where useful
- **Git** · For version control of virtually everything
- **html, CSS** · Used for this curriculum vitae (with markdown → Pandoc)

Programming

- **Python** · Numpy, scipy, cython, matplotlib, dask, pandas
- **Jupyter** · Lab and notebooks. Used for daily data analysis
- **MATLAB** · Data analysis, powerful toolset for engineers and scientists with full workflow experience
- **Mathematica** · Symbolic computing
- **SLURM** · Job manager used for cluster computing
- **C++** · Used for side projects
- **Fortran** · HPC applications such as GENE
- **Bash**, **Make** · Experience with linux scripting and development
- **MPI**, **OpenMP** · Used for parallelisation for HPC

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