

LUIS VELA VELA PHD

Sr. AI Scientist & ML Team Lead | Computational Physicist



CONTACT

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CORE COMPETENCIES

ML Engineering & HPC

- PyTorch / TensorFlow ●●●●●
- GPU Computing ●●●●●
(A100, H200, mixed precision)
- Distributed Computing ●●●●●
(CuPy, Dask, RAPIDS, Numba)
- MLflow / Experiment Tracking ●●●●●

AI Weather & NWP Models

- AI-NWP Deployment ●●●●●
(AIFS, Aurora, FourCastNet, GraphCast)
- AI Data Assimilation ●●●●●
(system design)
- S2S Forecasting ●●●●●
(weather regimes, ensemble methods)
- Probabilistic Verification ●●●●●
(CRPS, ensemble statistics)

Data Engineering & Processing

- Satellite Data Processing ●●●●●
- GRIB2 & Data Pipelines ●●●●●
- ERA5 Reanalysis ●●●●●

Programming & Tools

- Python ●●●●●
(xarray, NumPy, Pandas, Matplotlib, Cartopy)
- Bash ●●●●●
- FORTRAN ●●●●●
- Git / CI/CD / Conda ●●●●●
- AWS / Cloud ●●●●●

Solution Architecture

- HPC Infrastructure Design ●●●●●
- Technical Discovery ●●●●●
- Client Engagement ●●●●●

Leadership

- ML Team Management ●●●●●
(2 direct reports)
- Cross-functional Collab ●●●●●
- Stakeholder Communication ●●●●●

LANGUAGES

- Spanish ●●●●●
Native
- English ●●●●●
Fluent / Professional
- French ●●●●●
Conversational
- Serbian ●●●●●
Conversational
- Czech ●●●●●
Conversational
- German ●●●●●
Working knowledge

KEY ATTRIBUTES

- Production AI/ML delivery at scale
- Scientific rigor & operational focus
- Customer success & stakeholder communication
- Cross-functional team builder

PROFESSIONAL SUMMARY

Sr. AI Scientist & ML Team Lead with deep expertise in machine learning, computational physics, and high-performance computing. Leads a team building AI-powered weather forecasting systems at a global satellite data company, with production experience spanning model deployment, large-scale data engineering, and distributed GPU computing. PhD in Computational Physics with a track record across scientific research (Amazon), HPC solution architecture (LuxProvide), and operational AI systems (Spire Global). Combines scientific depth with hands-on ML engineering, team leadership, and client-facing technical communication.

PROFESSIONAL EXPERIENCE

-  Nov 2022 – Present
- Spire Global, Luxembourg

Sr. AI Scientist & ML Team Lead

- Lead a team of ML engineers at a global satellite data and analytics company, building AI-powered weather forecasting systems for energy, maritime, aviation, and smart agriculture markets.
- **AI Model Deployment:** Architected and deployed production infrastructure for multiple AI numerical weather prediction models (AIFS, Aurora), including full pipeline from data ingestion through ensemble-based forecast delivery.
 - **Subseasonal Forecasting:** Built S2S forecasting pipelines with weather regime classification and ensemble probability tracking across 46-day forecast horizons.
 - **Data Engineering:** Designed multi-source data pipelines handling satellite observations, GRIB2 datasets, and ERA5 reanalysis data at scale.
 - **Renewable Energy Forecasting:** Developed weather-to-energy production forecast pipelines, translating atmospheric predictions into wind and solar energy output estimates.
 - **Model Verification:** Created forecast intercomparison tooling for multi-model evaluation across ensemble statistics, spatial fields, and weather regime projections.
 - **AI-Assisted Development:** Pioneered Claude Code adoption on HPC infrastructure, achieving 6–12x speedup in model repository development.
 - **Team Leadership:** Established engineering practices including experiment tracking (MLflow), shared repositories, code review standards, and documentation workflows.

Sr. Solutions Engineer

- Designed and delivered custom HPC/AI solutions for enterprise and research clients at Luxembourg's national supercomputing center.
- **Solution Architecture:** Led technical discovery sessions and designed compute solutions for GPU-intensive ML and simulation workloads.
 - **GPU Infrastructure:** Evaluated and benchmarked GPU platforms (A100, H200) for client workloads, including mixed-precision training configurations.
 - **Client Engagement:** Managed pre-sales technical engagements, proof-of-concept demonstrations, and onboarding for HPC clients across research and industry.

Research Scientist

- Applied advanced ML and statistical methods to deliver actionable business insights at scale.

-  Feb 2021 – Nov 2022
- LuxProvide, Luxembourg

-  Oct 2019 – Jan 2021
- Amazon, Luxembourg

EDUCATION

-  Sep 2013 – Feb 2019
- UC3M, Madrid | UGent, Ghent

-  Sep 2011 – Jul 2013
- UC3M, Madrid | UGent, Ghent

-  Sep 2007 – Jul 2010
- Charles University, Prague

PhD in Computational Physics

Specialized in computational methods for complex physical systems. Developed algorithms for HPC environments.





MSc in Plasma Physics

Statistical analysis and modeling of complex dynamic systems.




BSc in Physics

Foundation in computational physics and simulation methods.

ACHIEVEMENTS & RECOGNITION

-  Outstanding Colombian Abroad — Award by the Colombian Government
-  Summa Cum Laude — PhD Thesis
-  Greatest Distinction — 2013 Erasmus Mundus Master
-  UNESCO Fellowship — Bachelor Studies Scholarship

SELECTED PUBLICATIONS

-  [Magneto-hydrodynamical nonlinear simulations of magnetically confined plasmas using smooth particle hydrodynamics \(SPH\)](#)
-  [A positioning algorithm for SPH ghost particles in smoothly curved geometries](#)
-  [ALARIC: An algorithm for constructing arbitrarily complex initial density distributions with low particle noise for SPH/SPMHD applications](#)