

LUIS VELA VELA PHD

Sr. AI Weather Scientist & ML Team Lead | AI-NWP, Satellite Data & Renewable Energy Forecasting



CONTACT

- ✉ vela.vela.luis@gmail.com
- ☎ +352 661 678965
- 📍 Luxembourg, Luxembourg
- 📄 OnlineResume
- ✉ @luisvela
- LinkedIn Luis Vela Vela

CORE COMPETENCIES

AI Weather Models & Foundation Models

AI-NWP Deployment
(AIFS, Aurora, FourCastNet, GraphCast)



AI Data Assimilation
(system design)



S2S Forecasting
(weather regimes, ensemble methods)



Probabilistic Verification
(CRPS, ensemble statistics)



Satellite Data & Observations

Satellite Data Processing
(Spire Global satellite constellation)



Radio Occultation (RO)



GRIB2 & Data Pipelines



ERA5 Reanalysis



Model Intercomparison



Renewable Energy Forecasting

Weather-to-Energy Pipelines



Wind & Solar Prediction



ML Engineering & HPC

PyTorch / TensorFlow



GPU Computing
(A100, H200, mixed precision)



Distributed Computing



(CuPy, Dask, RAPIDS, Numba)

MLflow / Experiment Tracking



Programming & Data

Python



(xarray, NumPy, Pandas, Matplotlib, Cartopy)

Bash



FORTRAN



Git / CI/CD / Conda



Leadership

ML Team Management
(2 direct reports)



Cross-functional Collab



LANGUAGES

Spanish



Native

English



Fluent / Professional

French



Professional

Serbian



Conversational

Czech



Conversational

German



Working knowledge

KEY ATTRIBUTES

- ▶ AI weather model deployment at scale
- ▶ Satellite-to-forecast pipeline expertise
- ▶ Scientific rigor & operational delivery
- ▶ Cross-functional team builder

PROFESSIONAL SUMMARY

Sr. AI Weather Scientist leading a team that builds and deploys AI-powered weather forecasting systems at a global satellite data company. Deep expertise in AI numerical weather prediction models (AIFS, Aurora, FourCastNet), satellite observational data processing, and weather-to-energy production forecasting. PhD in Computational Physics with production experience spanning the full NWP pipeline — from satellite data ingestion and AI model inference to ensemble-based renewable energy forecasts. Combines scientific depth with hands-on ML engineering, HPC operations, and team leadership.

PROFESSIONAL EXPERIENCE

Nov 2022 – Present
Spire Global, Luxembourg

Sr. AI Weather Scientist

Lead a team of ML engineers at a global satellite data and analytics company, building AI-powered weather forecasting systems that serve energy, maritime, and aviation markets.

- ▶ **AI Weather Models:** Architected and deployed production infrastructure for multiple AI numerical weather prediction models (AIFS, Aurora), including full pipeline management from satellite data ingestion through ensemble-based forecast delivery.
- ▶ **Satellite Data Integration:** Process and integrate satellite observational data — including radio occultation profiles — into AI weather forecasting workflows, bridging raw satellite observations with ML model inputs.
- ▶ **Renewable Energy Forecasting:** Develop weather-to-energy production forecast pipelines, translating atmospheric predictions into actionable wind and solar energy output estimates.
- ▶ **Subseasonal Forecasting:** Built S2S forecasting pipelines with weather regime classification and ensemble probability tracking across 46-day forecast horizons.
- ▶ **Model Verification:** Created Python-based forecast intercomparison tooling for multi-model evaluation across ensemble statistics, spatial fields, and weather regime projections.
- ▶ **Data Engineering:** Deep expertise in GRIB2 format handling, ERA5 reanalysis processing, and multi-model data pipelines at scale.
- ▶ **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 clients, including GPU infrastructure evaluation (H200), technical discovery, and solution architecture for compute-intensive scientific workloads.

Research Scientist

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

EDUCATION

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

PhD in Computational Physics

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

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

MSc in Plasma Physics

Statistical analysis and modeling of complex dynamic systems.

Sep 2007 – Jul 2010
Charles University, Prague

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 in smoothly curved geometries
- 📄 ALARIC: An algorithm for constructing arbitrarily complex initial density distributions with low particle noise for SPH/SPMHD applications