

Luis Vela Vela PhD

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



CONTACT

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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.

- 📅 Feb 2021 – Nov 2022
- LuxProvide, Luxembourg

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.

- 📅 Oct 2019 – Jan 2021
- Amazon, Luxembourg

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