

Najda Villefranque

Candidate aux élections au CoNRS - Section 21 - Collège B1

contact

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languages

French: native
English: advanced
Spanish & Portuguese:
intermediate

programming

bash
C, Fortran
Python, R

software

htrdr,
htexplo,
objects,
Meso-NH,
ecRad

production

22 articles
26 talks and posters
3 software

profile

I develop advanced numerical tools and use them to better understand and model the effects of geometrically complex clouds on radiation. These are important for weather forecast, climate modelling, and complex energetic systems such as cities or solar power plants. My activity is connected to, and driven by, collective scientific directions elaborated within two national research groups, Dephy (atmosphere) and EDStar (energy).

research

2022 – today	CNRM, Toulouse	CNRS Research Scientist, S21, CID 55
	Simulation and analysis of convection-cloud-radiation couplings using Large-Eddy Models and Monte Carlo methods	
2021–2022	ECCC, Canada (from LMD, Paris) H. Barker	Post-doctorate
	Efficient Monte Carlo algorithms for the EarthCARE satellite mission	
2020–2021	LMD, Paris J.-L. Dufresne, F. Hourdin	Post-doctorate
	Calibration of ecRad RT scheme using machine learning tools	
2016–2019	CNRM, LAPLACE, Toulouse F. Couvreux, R. Fournier	Research thesis
	Development of Monte Carlo (MC) codes for 3D radiative transfer (RT) Analysis of 3D solar RT in high-resolution cloudy atmospheres	
04–05 2018	ECMWF, Reading R. J. Hogan, M. Ahlgrimm	Research visit
	Analysis of boundary-layer cloud and surface solar radiation measurements	

education

2016–2019	Ph.D. student in Atmospheric Science Université Toulouse III, CNRM, LAPLACE	
	The 3D Radiative Effects of Boundary-Layer Clouds Successfully defended on 15th Nov. 2019	
2011–2016	Engineering school (French Grande Ecole)	INSA, Toulouse
	Applied Mathematics, Numerical modeling	
2010	Scientific French Baccalauréat w. highest honors	Lycée des Arènes, Toulouse
	Specialized in Physics and Chemistry	

teaching

2024–2025	Modélisation du Transfert Radiatif M2 SOAC	UT3/ENM, Toulouse
	10h, 13 students	
2024–2025	GNU/Linux First-year technician	ENM, Toulouse
	18h, 3×12 students	
2017–2019	Fortran 90 First-year engineers	ENM, Toulouse
	2×24h, 20 students	

mentoring

2022–today	Co-encadrement thèse Maëlle Coulon–Decorzens	Sorbonne Université, Paris
	Radiative effect of clouds and climate model tuning	
06–11 2024	Encadrement stage M1 Paola de Truchis de Varennes	INSA Toulouse
	Single Monte Carlo formulation of coupled radiation – cloud geometry model	
2019–2023	Co-encadrement thèse Raphaël Lebrun	Sorbonne Université, Paris
	Modeling of vertical cloud overlap and impacts on radiation	

animation

2024–today	Groupe Thématique Rayonnement Co-lead Formation and tutorials	Météo-France
2022–today	GdR Dephy Steering Committee Scientific direction, annual workshop	National
2022–today	GdR EDStar Steering Committee Scientific direction, annual workshop	National

projects

2024–2030	PEPR TRACCS CNRM/IPSL/LSCE/IGE Global climate modelling and tuning	IMPRESSION-ESM , QUINTET
2023–2027	ANR MCMET RAPSODEE/CNRM/LEMTA/IP Monte Carlo methods for energy systems – PI of WP2	M. El Hafi
2023–2025	PNTS SMCLOUD CETHIL/CNRM/LOA Symbolic Monte Carlo methods for cloud remote sensing	M. Galtier
2021–2025	CARDINAL KNMI/ECMWF/LMD/ECCC/FUB/... Development and evaluation of retrieval algorithms for EarthCare L2 products	ESA
2021–2025	ANR MC2 LMAP/CNRM/LMD Monte Carlo methods for urban meteorology and climate	C. Caliot
2018–2022	ANR MCG-RAD LMD/LAPLACE/IRIT Monte Carlo estimation of globale radiative forcings	J.-L. Dufrense
2016–2020	ANR HIGH-TUNE CNRM/LMD/LAPLACE Radiative effect of clouds and model tuning	F. Couvreux