



## Andrés Yarce Botero

Ph.D. in Applied Mathematics Delft University of Technology, The Netherlands. Physical Engineer - EAFIT, MSc Applied Physics - EAFIT. Colombia. Assimilation of satellite data in Chemical Transport Models models and data-driven emission estimation techniques.

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## Recent Experience

- Recognized researcher at **Barcelona Supercomputing Center**, Earth Science department Atmospheric composition group, Data Assimilation Forecasting and Analysis. Working on Satellite emission estimation using lightweight data-driven computational methods 2024 . 2026
- Postdoc at **TuDelft-KNMI-VU-TNO-Wageningen** PIPP project "High Resolution to Exploit Nitrogen Chemical Compound Observations from Space in the Netherlands."  
2021 - feb2024

## Education

- Postgraduate: PhD Applied Mathematics - TuDelft 2017 - 2024
- Postgraduate: PhD Ingenieria Matematica - Universidad EAFIT 2017 - 2024
- Postgraduate: Ms. Applied Physics - Universidad EAFIT 2015 - 2016
- Undergraduate: Physics Engineering - Universidad EAFIT 2010 - 2014
- Undergraduate Studies - Physics-Universidad de Antioquia 2006 - 2009

## Publications & Academic Events

- **ANDRES YARCE BOTERO**. Monteil G., Escribano J., Emili E., Albarracin A., Guevara M., O. Jorba. Assessing lightweight satellite inversion methods for industrial NO<sub>x</sub> emissions in Spain and the United States. (2026). In preparation
- **ANDRES YARCE BOTERO**, van Weele, M., Siebesma, P., Boersma F., & Eskes, H. Evaluation of Simulated Vertical NO<sub>2</sub> Profiles over the North Sea Using LOTOS-EUROS with Two Meteorological Forcings (HARMONIE and ECMWF) with Aircraft NO<sub>2</sub> profiles. EGU sphere, 2026. In revision
- Araque, V. S., **ANDRES YARCE BOTERO**, Hinestroza-Ramirez, J. E., Fernandez-Restrepo, F., Estrada, S. C., Osorio-Marulanda, P. A., ... & Quintero, O. L. (2026). Modelling patterns of Population Exposure with a multiscale framework utilising LOTOS-EUROS Chemical Transport Model, mobility surveys and particulate toxicity. Authorea Preprints and accepted in GEOhealth Wiley journal.
- **ANDRES YARCE BOTERO**, van Weele, M., Segers, A., Siebesma, P., & Eskes, H. [Investigating the impact of HARMONIE-WINS50 \(cy43\) and LOTOS-EUROS \(v2. 2.002\) coupling on NO<sub>2</sub> concentrations in The Netherlands](#). EGU sphere, 2023, 1-21. (2024).
- **ANDRES YARCE BOTERO** et al., [Design and Implementation of a Low-Cost Air Quality Network for the Aburra Valley Surrounding Mountains](#)., Pollutants 3.1 17, 549 (2023).
- Hinestroza-Ramirez, J. E., Lopez-Restrepo, S., **ANDRES YARCE BOTERO**, Segers, A., Rendon-Perez, A. M., Isaza-Cadavid, S., et.al, Quintero, O. L. , [Improving Air Pollution Modelling in Complex Terrain with a Coupled WRF–LOTOS–EUROS Approach: A Case Study in Aburrá Valley, Colombia](#), Atmosphere, 14(4), 738. (2023)
- **ANDRES YARCE BOTERO**, Lopez-Restrepo, S., Pinel Peláez, N., Quintero, O. L., Segers, A., & Heemink, A. W. [Estimating NO<sub>x</sub> LOTOS-EUROS CTM Emission Parameters over the Northwest of South America through 4DnVar TROPOMI NO<sub>2</sub> Assimilation](#). Atmosphere, 12(12), 1633. (2021).
- **ANDRES YARCE BOTERO**, Marco Alunno, [Signal modeling of the conditioning stage of a parametric array loudspeaker by statistical design of experiments - ScienceDirect](#), Applied Acoustics, Volume 174, 107713, ISSN 0003-682X,. (2021)
- Santiago Lopez Restrepo, **ANDRES YARCE BOTERO**, Nicolas Pinel Pelaez, Olga Lucia Quintero Montoya, [Urban Air Quality Modeling Using Low-Cost Sensor Network and Data Assimilation in the Aburrá Valley, Colombia](#). In: Atmosphere ISSN: 2073-4433 ed: Multidisciplinary Digital Publishing Institute (MDPI) v.12 fasc.91 p.1 - 18, (2021)
- Santiago Lopez-Restrepo, **ANDRES YARCE BOTERO**, Nicolas Pinel, O.L. Quintero, Arjo Segers, A.W. Heemink, [Forecasting PM<sub>10</sub> and PM<sub>2.5</sub> in the Aburrá Valley \(Medellín, Colombia\) via EnKF based data assimilation - ScienceDirect](#), Atmospheric Environment, Volume 232,117507, ISSN 1352-2310. (2020)
- **ANDRES YARCE BOTERO** et al., [HIPAE Helicopter-borne In-situ Pollution Assessment Experiment: plataforma alternativa para la medición de contaminantes en capas verticales](#) [Not available in English], Congreso Colombiano y Conferencia Internacional de Calidad de Aire y Salud Pública (CASAP), Barranquilla, Colombia, 2019, pp. 1-5, 10.1109/CASAP.2019.8916711 (2019)
- **ANDRES YARCE BOTERO**, Design of a smart solar panel prototype focused on the CubeSat mission. In: the United States of America. Universidad Cal Poly San Luis Obispo, CA 2013. Evento: X Cubesat Developers Workshop Ponencia: Design of a Solar panel Prototype focused on CubeSat Mission. (2013)

## Events organizer

- **I Plumes Seminar at BSC:** “Accurate space-based NO<sub>x</sub> emission estimates with the FDA require fine-scale model information on local oxidation chemistry and profile shapes” from Felipe Cifuentes KNMI 25/10/2024
- **II Plumes Seminar at BSC:** “Monitoring Methane Super-emitters from Space” from Ana Isabel Lopez SRON 02/10/2025  
<https://www.bsc.es/research-and-development/research-seminars/sorwomeninbsc-monitoring-methane-super-emitters-space>
- **III Plumes Seminar at BSC:** “Top-Down Constraints on Urban NO<sub>x</sub> Emissions in Bangkok from Geostationary Satellite Observations” from Julianna (Julie) Christopoulos UCLA 12/02/2026  
<https://www.bsc.es/research-and-development/research-seminars/sorwomeninbsc-top-down-constraints-urban-no%E2%82%93-emissions-bangkok-geostationary-satellite-observations>

## Projects experience

- **IGAC ECR Development grant 2026** .Funding amount: 2.000 \$. Cloud Computing for Atmospheric Chemistry: Development and Evaluation of an Interactive CTM System.
- **Proyecto. 859 Ministerio de Ciencia, Tecnología e Innovación Colombia. ANDRES YARCE BOTERO. (Universidad EAFIT). 19/01/2020- 19/02/2021.**Funding amount: €27,250. Principal investigator. Call for proposals to support a spin-off company established by EAFIT University. The in-kind support provided by the Colombian Ministry of Science and Technology helped strengthen the initiative by providing guidance on developing the business model, brand development, and other key components of the spin-off venture.
- **Experimental leader** in Project KRATOS (2019) Universidad EAFIT [Kratos EAFIT Postobón - High altitude balloon team](#)
- “The SoundHouse” Art Sound Installation 2015. Universidad EAFIT Marco Alunno, Andrés Yarce [The Soundhouse](#)
- **Organizer conferences** cycle [Aerospace Integration and Development](#) 2014-02. Invitados Jeroslav Laifr, Republica Checa reference.
- Bruno Sousa Brasil: reference ([Bruno Sousa-Primer Ciclo de conferencias tecnología aeroespacial Septiembre 2014](#)) y Luz Maria Martinez NASA JPL
- **Project grant** Colciencias 617 2013-02 fortalecimiento de semilleros SEMA “Earth Observation EO”.
- Member of the Initial research group of theoretical and computational physics. 2011-2014.
- Member of the Initial research group in applied Electromagnetism Group (SEMA). 2012 -2014.
- **Research advisor project** TEES Energy Transmission between satellites 2014, Dedication: 10 hours per week.
- Rockets summer course Universidad EAFIT 2015. Course: History of small satellites, access to space.
- **Research advisor search Information.** Proyecto Ingeniería a la N, Universidad de los niños, Universidad EAFIT, Dedication: 10 hours week. October 2014-November 2013.
- **Project leader EAFITHAB 1.** Mission High Altitude Balloon Universidad EAFIT. Best stories [EAFIT HAB 1 - SEMA](#)

- **Research and Development** - Title: Technological surveillance project CubeSat Universidad EAFIT June 2013-December 2013, Professional Internship. Dedication: 48 hours per week

## Awards and distinctions obtained

- -Best stories in the Global Space Balloon Challenge GSBC event, Stratospheric balloon launch. Winners: Best Design GSBC. Jun 2018 Issued by Global Space Balloon Challenge (GSBC) Sponsors: Massachusetts Institute of Technology (MIT), Stanford University, University of Michigan
- Winner of the Antioquia Thinks Big 2016 Innovation Competition, Aerospace and Multimodal Transport Sector. Issued by the Secretariat of Productivity and Competitiveness, Government of Antioquia, Colombia · Nov. 2016
- Recognition of an undergraduate degree dedicated to Research 2014. MEDELLIN Higher Education Agency

## Further training

- Universidad EAFIT: Diploma Technological Surveillance and Competitive Intelligence. June 2013 – November de 2013
- Short duration courses: Universidad EAFIT: Diploma Write for publishing and Scientific communication. August 2013 – December 2013
- Other: Universidad EAFIT Advance Optic Design. September 2013
- Other: Learning Basic Entrepreneurship SENA - Regional Medellín. June 2009 – August 2009
- Short duration courses: Art Museum Medellín, Audiovisual creation course. March - 2006 – July – 2006

## Additional experience

- **Spinoff Co-founder and CEO** SimpleSpace EAFIT (2020-2023) (<https://www.linkedin.com/pulse/simplespace-una-manera-de-simple-conectarse-al-espacio/> )
- **Lecturer** Environmental Modelling for Biology program Universidad EAFIT (2020-01/2020-02/2021-01).
- **Science Project Advisor** Universidad de los niños program(<https://www.eafit.edu.co/sistema-ciencia-tecnologia-innovacion/universidad-ninos> ). Universidad EAFIT (2014-2015). References: (+57-4) 2619500 Ext. 9695
- **Member of the steering committee LAECESS** (Latin America Early Career Earth System Scientist Network) <https://laearlycareer.wixsite.com/latinamericaecess/about-us> Network designed for early career scientists, where we promote the advancement of science through the creation of, and collaboration with, regional and international projects.

## References

- Michiel van Weele KNMI - The Netherlands [michiel.van.weele@knmi.nl](mailto:michiel.van.weele@knmi.nl) <https://www.knmi.nl/over-het-knmi/onze-mensen/michiel-van-weele>

- Arnold W. Heemink. TUDelft - The Netherlands [A.W.Heemink@tudelft.nl](mailto:A.W.Heemink@tudelft.nl)  
<https://research.tudelft.nl/en/persons/aw-heemink>
  - Arjo Segers TNO - The Netherlands [arjo.segers@tno.nl](mailto:arjo.segers@tno.nl)  
<https://www.researchgate.net/profile/Aj-Segers>
  - Jeronimo Escribano - Barcelona Supercomputing Centre Spain [jeronimo.escribano@bsc.es](mailto:jeronimo.escribano@bsc.es)  
<https://www.bsc.es/escribano-alisio-jeronimo>
  - Piers Siebesma TuDelft -Nederland [A.P.Siebesma@tudelft.nl](mailto:A.P.Siebesma@tudelft.nl)  
<https://research.tudelft.nl/en/persons/ap-siebesma>
  - Olga Lucia Quintero Montoya [oquinte1@eafit.edu.co](mailto:oquinte1@eafit.edu.co)  
<https://www.eafit.edu.co/docentes-investigadores/Paginas/olga-lucia-quintero-montoya.aspx>
  - Nicolas Pinel Pelaez [npinelp@eafit.edu.co](mailto:npinelp@eafit.edu.co)  
<https://www.eafit.edu.co/docentes-investigadores/Paginas/nicolas-pinel-pelaez.aspx>
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## Skills

- Python
- Git
- AWS
- HPC
- Matlab
- Xarray
- QGIS
- Fortran
- Pytorch
- Airtable (Project Management)

## Languages

- *English* - Professional
  - *Italian* -Basic
  - *Dutch* - Basic
  - *Spanish* - Native
  - *Catalán* - Basic
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