



## 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.. NO<sub>x</sub> point source emission estimation using TROPOMI and data-driven emission quantification methods over Spain. (2025). 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, 2025. In revision
- **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/sors-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/sorswomeninbsc-top-down-constraints-urban-no%E2%82%93-emissions-bangkok-geostationary-satellite-observations>

## Projects experience

- **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 María Martínez 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

- Categoría: Best stories in the Global Space Balloon Challenge GSBC event, Stratospheric balloon launch EAFITHAB 1. 2014 and project Kratos two categories in GSBC 2019
- 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)
- **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

## References

- Michiel van Weele KNMI - Nederland [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 - Nederland [A.W.Heemink@tudelft.nl](mailto:A.W.Heemink@tudelft.nl)  
<https://research.tudelft.nl/en/persons/aw-heemink>
- Arjo Segers TNO - Nederlands [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 [oquintel@eafit.edu.co](mailto:oquintel@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

### Languages

- *English* - Professional
  - *Italian* -Basic
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- AWS
  - HPC
  - Matlab
  - Xarray
  - QGIS
  - Fortran
  - Pytorch
  - Airtable (Project Management)

- *Dutch* - Basic
  - *Spanish* - Native
  - *Catalán* - Basic
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