

# PHILIPPINE BURDEAU

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## EDUCATION

### Stanford University, Doerr School of Sustainability

PhD in Energy Science and Engineering under the supervision of Prof. Adam Brandt

2022 – 2026

Stanford, California

- Statistical methods for quantifying methane emissions from measurement data
- Areas: geostatistics, bayesian inference, emission inventory reconciliation, remote sensing

### Università Bocconi

MSc in Politics and Policy Analysis

2020 – 2022

Milan, Italy

- Master thesis: determining optimal conditions for a CCS network in Italy using a cooperative game theory model
- Areas: game theory, public economics, social and economic networks

### École Polytechnique

MSc in Science and Engineering - Grandes Ecoles / Ingénieur Polytechnicien Program

2017 – 2021

Palaiseau, France

- Areas: applied mathematics, modern physics

### Lycée Sainte-Geneviève

Preparatory school for the French Grandes Ecoles (MPSI - MP\*)

2015 – 2017

Versailles, France

- Areas: mathematics, physics

## RESEARCH AND WORK EXPERIENCE

### Environmental Assessment and Optimization Group - Research Assistant

*Prof. Adam Brandt's research group*

Sept 2022 - Now

Stanford, California

- Working on statistical methods for quantifying methane leaks and estimating their impact, and on the design, implementation and analysis of data from controlled release experiments

### Insight M - Research Intern

*Methane emissions management company*

Jun - Aug 2024

Sunnyvale, California

- Updating and improving a stochastic bottom-up model for predicting methane emissions

### Kearney - Business Analyst Intern

*Global consulting firm*

May - Nov 2021

Paris, France

- Within the Kearney's Energy Transition Institute, drafted a techno-economic report on Carbon Emissions Management
- Supported due diligence for a car insurer evaluating startup partnerships and acquisitions

### France Stratégie Economics department - Research Intern

*Policy advisory agency to the French Prime Minister*

Apr - Aug 2020

Paris, France

- Defined a socio-economic formula of the costs of greenhouse gas abatements in the French building sector
- Built and programmed a physics-based model to assess the efficiency of thermal renovations

### École Polytechnique – Scientific Group Project

*Student-led research project supervised by Prof. Emmanuel Joffre and Prof. Daniel Suchet*

Sep 2018 – Jun 2019

Palaiseau, France

- Built a quantum remote laboratory in a group of 5 students
- [quantum-physics.polytechnique.fr](http://quantum-physics.polytechnique.fr)

### Systra - Assistant Manager Intern

*Leading engineering group in transportation solutions (6,700 people, €380m turnover)*

June - Aug 2019

Paris, France

- Supported the manager of a team of 20 railway project managers and assisted them on their worksites

### French Navy - Officer

*Human and military training on a military base*

Sept 2017 - May 2018

Noumea, New-Caledonia

- Worked as an advisor to the Naval Base Commander and integrated a navy crew for a mission in the Pacific Ocean

## PUBLICATIONS

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<b>High-resolution national mapping of natural gas composition substantially updates methane leakage impacts</b> <i>Burdeau P., Sherwin E., Berman E., Biraud S., Brandt, A.</i> <a href="#">Nature Communications</a> - <a href="#">link</a>	2025
<b>Statistical inference of intermittent methane emissions from heterogeneous measurements</b> <i>Burdeau, P., McManemin, A., Sherwin, E., Wetherley, E., Berman, E., Brandt, A.</i> <a href="#">AGU Fall Meeting Abstracts</a> , SY41C	2025
<b>Carbon Intensity of United States Natural Gas Supply</b> <i>Zhang, Z., Rutherford, J., Littlefield, J., Ramadan, F., Ali Saafi, M., Ren, B., Y Jabbar, M., Saad, D., Burdeau P., Masnadi, M., Brandt, A.</i> <a href="#">Environmental Science &amp; Technology</a> (in review)	2025
<b>Controlled release testing of commercially available methane emission measurement technologies at the TADI facility</b> <i>McManemin, A., Juéry, C., Blandin, V., France, J.L., Burdeau P., Brandt, A.</i> <a href="#">Atmospheric Measurement Techniques</a> (in review) - preprint	2025
<b>Creating accurate methane emission inventories through data-driven airborne survey strategies: methods and results from the Anadarko and Haynesville basins, USA</b> <i>Yakovlev, P.V., Sherwin, E.D., Burdeau, P., Brandt, A.R., Kruguer, J., Berman, E.S.F., Kamdar, H.</i> <a href="#">AGU Fall Meeting Abstracts</a> , A13N-01	2024
<b>Single-blind test of nine methane-sensing satellite systems from three continents</b> <i>Sherwin, E., El Abbadi, S., Burdeau, P., Zhang, Z., Chen, Z., Rutherford, J., Chen, Y., Brandt, A.</i> <a href="#">Atmospheric Measurement Techniques</a> - <a href="#">link</a>	2024
<b>Technological maturity of aircraft-based methane sensing for greenhouse gas mitigation</b> <i>El Abbadi, S., Chen, Z., Burdeau, P., Rutherford, J., Chen, Y., Zhang, , Sherwin, E., Brandt, A.</i> <a href="#">Environmental Science &amp; Technology</a> - <a href="#">link</a>	2024
<b>Comparing continuous methane monitoring technologies for high-volume emissions: a single-blind controlled release study</b> <i>Chen, Z., El Abbadi, S., Sherwin, E., Burdeau, P., Rutherford, J., Chen, Y., Zhang, Z., Brandt, A.</i> <a href="#">ACS ES&amp;T Air</a> - <a href="#">link</a>	2024
<b>Comprehensive evaluation of aircraft-based methane sensing for greenhouse gas mitigation</b> <i>El Abbadi, S., Chen, Z., Burdeau, P., Rutherford, J., Chen, Y., Zhang, Z., Sherwin, E., Brandt, A.</i> <a href="#">EarthArXiv preprint</a> - <a href="#">link</a>	2023
<b>Independent evaluation of methane sensing satellites, airplanes, and continuous monitoring ground sensors</b> <i>El Abbadi, S., Chen, Z., Burdeau, P., Rutherford, J., Chen, Y., Sherwin, E., Zhang, Z., Brandt, A.</i> <a href="#">AGU Fall Meeting Abstracts</a> - <a href="#">link</a>	2023
<b>Carbon emissions assessment: towards accurate control</b> <i>Burdeau, P., Debarre, R., Gahlot P., Grillet, C.</i> <a href="#">Kearney Energy Transition Institute Report</a> - <a href="#">link</a>	2022

## TALKS

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<b>AGU25 poster session SY41C: Statistical inference of intermittent methane emissions from heterogeneous measurements</b>	2025
<b>Stanford ESE in 2050 poster session: High-resolution national mapping of natural gas composition substantially updates methane leakage impacts - Best Poster Award</b>	2025
<b>Methane Emissions Technology Alliance (META) Seminar (Stanford University &amp; LBNL) - recorded</b>	2024
<b>CEOS side meeting at IWGGMS (CNES, Paris)</b>	2023

## PROFESSIONAL ENGAGEMENT

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Core Member, Methane Technology Alliance seminar series

2024 – Present

## HONORS AND AWARDS

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**First place in the Stanford ESE in 2050 poster contest** (awarded to 1 poster out of 33)

2025

Fulbright grant from Fondation Monahan

2022

**Ecole Polytechnique Best Scientific Group Project Prize** (awarded to 3 groups out of 120)

2019

## ACADEMIC SERVICE

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Reviewer, ACS ES&T Air

2024, 2025

Reviewer, Tackling Climate Change with Machine Learning at ICLR

2025

Reviewer, Climate Change AI Innovation Grants Program

2024

## TEACHING EXPERIENCE

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**Course Assistant - Optimization**

Apr – Jun 2024

Instructor: Prof. Adam Brandt (Stanford University)

**Teaching Assistant in Preparatory School - Physics**

Sept 2018 – May 2019

Instructor: Prof. Niels Vandecasteele (Lycée Sainte-Geneviève)

- Prepared students for a nationwide ranked exam (X/ENS/Centrale/Mines)

## SOFTWARE

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**Code for: High-resolution national mapping of natural gas composition substantially updates methane leakage impacts** - [github.com/pburdeau/us\\_gas\\_composition](https://github.com/pburdeau/us_gas_composition) -

2025

**Interactive U.S. map of produced gas composition** - [pburdeau.github.io/us\\_map\\_gas\\_composition](https://pburdeau.github.io/us_map_gas_composition) - doi:10.5281/zenodo.17246945

2025

**BU\_methane\_model** - [github.com/JSRuthe/BU\\_methane\\_model](https://github.com/JSRuthe/BU_methane_model) (python version)

2024

## SKILLS

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### Languages

English (TOEFL 110, professional proficiency), French (Native), Italian, German

### Programming

Python; C++; Matlab; proficiency in Julia, R, Stata, VBA and Java

## EXTRACURRICULARS

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### Writing & Journalism

École Polytechnique alumni network's journal (20k circulation)

- Core member of the journal's editorial committee
- Wrote articles for the 50th anniversary of the school opening to women - [Read article](#)

### Music

Piano (19 years, baroque music)