

# Pedro Brunialti Lima de Andrade

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## Areas of interest

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Homotopy Theory, Algebraic Topology and Mathematical Physics

## Education

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### University of Virginia

*Ph.D. in Mathematics – Advisor: Prof. Julie Bergner*

**Charlottesville**

*2022-Present*

### Federal University of Minas Gerais - UFMG

*M.Sc. in Mathematics – Advisor: Prof. Rodney Josué Biezuner*

**Belo Horizonte**

*2020-2022*

Title: Comparing Models for  $(\infty, 1)$ -categories.

### Federal University of Minas Gerais - UFMG

*B.Sc. in Physics*

**Belo Horizonte**

*2016-2019*

## Publications

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### Articles

- [1] Abdelmalek Abdesselam, Pedro Brunialti, Tristan Doan, and Philip Velie. A bijection for tuples of commuting permutations and a log-concavity conjecture. *Res. Number Theory*, 10(2):Paper No. 45, 10, 2024.

## Scholarships

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*Academic Excellence Program (PROEX)*

*2020-2022*

*M.Sc. program scholarship.*

*Program of Undergraduate Research Scholarships (CNPq)*

*2018-2019*

*Undergraduate research scholarship.*

## Teaching experience

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### Calculus II

*Instructor of record, Mathematics Department, Univeristy of Virginia*

*Fall 2025*

### Survey of Calculus I

*Instructor of record, Mathematics Department, Univeristy of Virginia*

*Fall 2024*

### Calculus I

*Instructor of record, Mathematics Department, Univeristy of Virginia*

*Spring 2024*

### A Survey of Calculus II

*Instructor of record, Mathematics Department, Univeristy of Virginia*

*Fall 2023*

### Calculus II

*Teaching assistant, Mathematics Department, Univeristy of Virginia*

*Spring 2023*

## Calculus III

Teaching assistant, Mathematics Department, University of Virginia

Fall 2022

## Differential Equations A

Teaching assistant, Dep. of Mathematics, ICEx, UFMG

10/2021-01/2022

## Analytic Geometry and Linear Algebra

Teaching assistant, Dep. of Mathematics, ICEx, UFMG

05/2021-09/2021

## Mentoring

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### University of Virginia Math Experimental Lab

Co-mentor: Thomas Jaklitsch. Project: Compass and Straightedge Constructions.

Spring 2026

### University of Virginia Directed Reading Program

Mentee: Zubin Kaul. Project: Differential geometry of curves and surfaces.

Fall 2024

Mentee: Mary Edith Plunkket. Project: Nonlinear dynamics and chaos.

Spring 2024

Mentee: Brian Meiser. Project: Hamiltonian mechanics and Poisson brackets.

Fall 2023

## Contributed talks

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### GSTGC Conference

Bi-incomplete Tambara Functors are almost never flat (planned)

04/2026

### BUGCAT Conference

$(\infty, 2)$ -symmetric monoidal categories with involutions

11/2025

### University of Virginia Graduate Seminar

Chern classes in physics

09/2025

### University of Virginia Graduate Seminar

Understanding and classifying TQFTs

08/2024

### University of Virginia Graduate Seminar

What are universal properties?

01/2024

### University of Virginia Graduate Seminar

A mathematical formulation of quantum mechanics

01/2023

### I Mathematics Meeting of Minas Gerais

Equivalence between homotopy theories

09/2021

### First Brazilian Meeting on Category Theory

Modern homotopy theory: model categories

01/2021

### First Brazilian Meeting on Category Theory

Tutorial: categories and functors

01/2021

### GFT group

Interpreting the measurement axiom

06/2021

### GFT group

The mathematics of gauge theories

06/2021

*The Serre-Swan Theorem and K-theory*

**Math-Phys-Cat group**  
01/2021

*An invitation to model categories*

**Math-Phys-Cat Group**  
10/2020

## **Conferences, schools, and workshops attended**

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BUGCAT Conference, Binghamton University	2025
Mathematical Congress of the Americas 2025, Miami, Florida, USA	2025
Mid-Atlantic Collaborative Workshop in Algebraic Topology, Lexington, Virginia, USA	2025
Atlantic TQFT Spring School 2025, University of New Brunswick	2025
AMTRaK Conference, University of Pennsylvania	2025
Mid-Atlantic Topology Conference, University of Virginia	2025
New England Algebraic Topology and Mathematical Physics, Providence College	2024
Encuentro Colombiano de Geometría y Topología, National Univeristy of Colombia	2024
Atlantic TQFT Spring School 2024, Memorial University Newfoundland	2024
Graduate Student Topology and Geometry Conference, Michigan State University	2024
BUGCAT Conference, Binghamton University	2023
Algebraic K-Theory and Redshift, Johannes Gutenberg University Mainz	2023
Topological Moonshine, University of Illinois, Urbana-Champaign	2023
Atlantic TQFT Spring School 2023, Wolfville, Nova Scotia, Canada	2023
Homotopy Theory in Honor of Paul Goerss, Northwestern University	2023
Field of Dreams Conference, Minneapolis, Minnesota, USA	2022
I Mathematics Meeting of Minas Gerais, virtual participation due to COVID-19	2021
First Brazilian Meeting on Category Theory, virtual participation due to COVID-19	2021
Toposes online, virtual participation due to COVID-19	2021

## **Academic service**

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President of the University of Virginia AMS Graduate Student Chapter	<i>Fall 2024 - Present</i>
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## **Languages**

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**Portuguese:** Native

**English:** Fluent

**Spanish:** Advanced

**French:** Intermediate