

# Wentao Cai

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## EDUCATION

**Nothereast University** <sup>[985 Project University]</sup> Shenyang, China  
Bachelor's degree in Applied Physics 2020.9-2024.6 (expected)

- Weighted Average Score: 84.7/100.
- Ranking in Major: 20%.

## ACDEMIC EXPERIENCE

### Research on Magnetic Monopoles and Black Holes

Supervisor: Prof. Chen Zhang 2023.3-Present

- Investigating the gravitational capture of magnetic monopoles by **primordial black holes** in the early universe, with a focus on:
  1. Proposing a non-inflationary solution to the **monopole problem**.
  2. Exploring the potential formation mechanism of **magnetic black holes**.
- Conducting comparative analyses of magnetic monopoles and **extremal magnetic black holes**, which evolved from a magnetic black hole through **Hawking radiation**.

### the Mathematical Contest in Modeling 2023

Honorable Mention 2023.2

- Introducing JS divergence as a distance function from information theory
- Optimizing a Monte Carlo model using a simulated annealing algorithm.
- Using a BP neural network to predict a time series model. results over time

## LANGUAGES

🗣 **English**  
TOEFL: **92** (2023.8)

🔗 **Programming**  
Python · Mathematica  
Matlab · Linux ·  $\text{\LaTeX}$

## SKILLS & LEARNED COURSES

**Python Programming**

**Group Theory**

**Advanced Quantum Mechanics**

**General Ralativity**

**Quantum Field Theory**

## AWARDS

2023 Honorable Mention  
2023 MCM

2022 Provincial Third Prize  
2022 MCM, China

2022 Excellent Students Scholarship  
Sophomore year