Queen's University GRADUATE STUDIES AND POSTDOCTORAL AFFAIRS

Admissions Application Form

Application Number: 20239013799-3
Legal Name: Boras, Ivanna
Preferred Name: Boras, Ivanna
Department: Physics, Engineering Physics and Astronomy
Program: Master of Applied Science
Start Date: May 2024

Title:	Ms	**Date Applied:**	2023-11-02
Prior Surname:		**Student Number:**	20214797
Date Of Birth:	2002-07-02	**Email:**	ivanna.007.b@gmail.com
Gender:	Female	**Pronouns:**	she/her,they/them

Current Address:

Street:	136 Mondial Cres		
City:	East Gwillimbury	**Province/State:**	Ontario
Postal Code:	L9N0S1	**Country:**	Canada
Current Address valid until:			

Permanent Address:

Street:	136 Mondial Cres		
City:	East Gwillimbury	**Province/State:**	Ontario
Postal Code:	L9N0S1	**Country:**	Canada

Home Phone:	9053922576	**Work Phone:**	
Cell Phone:	9053922576	**Work Phone Ext:**	

Country Of Residence: Canada
Country of Citizenship: Canada
Visa Status: Canadian Citizen

Are you a Canadian Citizen/Permanent Resident of Canada?	Yes
Is English your first language?	Yes
Within the last 12 months, have you studied for at least two academic terms at a post-secondary institution where English is the official language of instruction?	Yes

APPLICANT STATUS

Study Status: fulltime

Other Applicant Categories: Neither

Have you applied previously? No

LANGUAGES

Language 1:	Spanish	**Language 2:**	French
Reading:	Advanced	**Reading:**	Intermediate
Written:	Advanced	**Written:**	Intermediate
Comprehension:	Advanced	**Comprehension:**	Intermediate

RESEARCH INTERESTS

Research Interests:

Quantum Nanophotonics

Astroparticle Physics

Research Comments:

I find the field of quantum photonics very interesting. Last year I joined the Canadian Photonics online meet-up team where I became more exposed to the field. I quickly became interested and wanted to learn more about its applications. In my third-year quantum mechanics class I completed part of Xanadu's quantum computing notebook as my final assignment. I learned a lot about quantum algorithms and information, but I found the way their computer works to be the most interesting part. Understanding how light interacts with different devices is something I am interested in as I believe a lot can be done with these systems.

I am interested in astroparticle physics, more specifically Dark Matter and neutrino research. I have been involved in different summer schools and conferences with the McDonald Insitute about particle physics research. In the summer of 2023, I was an MI Fellow where I modelled Dark Matter propagation through the Earth and learned more about particle physics while doing so. I found learning about the way particles interact and behave very intriguing and would be interested in learning more.

Research Faculty Contact:

Nir Rotenberg
Aaron Vincent
Joe Bramante

ACADEMIC BACKGROUND

1. Most Recent Institution Attended:
Degree: Bachelor's of Applied Science
Name of Institution: Queen's University
Is this institution Queen's University, Kingston, Ontario?: Yes
Area of Study: Engineering Physics , electrical stream
Period From: September-2020 **Period To:** Present

Overall Average:	3.43	**Out Of:**	4.3
Final Year Average:	3.52	**Out Of:**	4.3
Subject Average:	3.49	**Out Of:**	4.3

If you have completed the GRE or GMAT test, indicate which one and enter the scores below.

None

GRE Subject Test or GMAT Score:
GRE or GMAT Quantitative Score:
GRE or GMAT Analytical Score:
GRE or GMAT Verbal Score:

PREVIOUS AWARDS

Have you received any scholarships, fellowships, prizes, other academic awards or professional awards during your university-level studies?: Yes

Name	Funding Source	Year Awarded	Duration	Amount
McDonald Institute Summer Research and Outreach Fellow	McDonald Institute	2023	4 months	10,672.87

FINANCIAL INFORMATION

Have you applied for any scholarships, fellowships, prizes, other academic awards or professional awards for financial support for your graduate studies?: Yes

Name	Funding Source	Amount
Canada Graduate Scholarships - Master's program	NSERC	17,500

Do you require Financial Support from Queen's University?: No

Do you want to be considered for a teaching assistantship?: Yes

PROFESSIONAL EXPERIENCE

1. Company/College:
McDonald Institute

Position Title:
Summer Research and Outreach Fellow

Period From: May-2023 **Period To:** August-2023

Description (maximum 750 characters):
I worked as a summer research and outreach fellow for the McDonald Institute where I developed a 6-week summer school program for kids in grades 8-10 where they learned about different areas of physics. Simultaneously, I was conducting my own research modelling Dark Matter propagation through the Earth. For my project, I compared different techniques used for Dark Matter modelling, namely one that uses Monte Carlo methods, one that uses a straight-line approximation and the final being an analytical modelling approach. I generated different exclusion plots for this project to compare the techniques and determine their validity at different Dark Matter cross-sections and masses.

2. Company/College:
Queen's Student Experience Office (SEO)

Position Title:
SOAR Peer Ambassador

Period From: June-2022 **Period To:** July-2022

Description (maximum 750 characters):
I was a summer orientation leader for incoming first years at Queen's University. I created and facilitated a variety of activities for the incoming first-years to play and get to know their peers during orientation. I spoke in student panels answering questions from incoming students, talked to them and their parents/supporters throughout the day and created a safe, inclusive space for everyone. I represented the university as well as the faculty of engineering when interacting with attendees. I was in charge of ensuring parking was running well, registering guests, and leading a variety of tours around the university. I ensured everyone felt safe and comfortable, often helping calm students who were in mild distress.

ADMISSION SCHOLARSHIPS

SCHOLARSHIPS FOR INDIGENOUS, BLACK, AND/OR OTHER CANADIAN VISIBLE MINORITY/RACIALIZED STUDENTS

SELF-IDENTIFICATION SECTION:

Are you: Indigenous Student: No

Black Canadian Student: No

Other Canadian Visible Minority: No

REFERENCES

Reference 1:	Aaron Vincent	**Reference 2:**	Nir Rotenberg
Email:	aaron.vincent@queensu.ca	**Email:**	nir.rotenberg@queensu.ca
Position:	Professor	**Position:**	Professor
Department:	Physics, Engineering Physics and Astronomy	**Department:**	Physics, Engineering Physics and Astronomy
Institution/Employer:	Queen's University	**Institution/Employer:**	Queen's University
Telephone:	613-533-2707	**Telephone:**	613-533-6000 ext. 79765

RESUME

List any skills and abilities that you feel are relevant to your area of study. Please put current and most recent first: (maximum 2000 characters)

McDonald Institute Summer Research and Outreach Fellow
I developed a 6-week summer school program for kids in grades 8-10 where they learned about different areas of physics. Simultaneously, I was conducting my research modelling Dark Matter propagation through the Earth. I compared other techniques used for Dark Matter modelling, namely one that used the Monte Carlo method, one that used a straight-line approximation and another being an analytical approach written in Python.

Queen's Space Engineering Team (QSET) member
I worked with the team for the Canadian Space Agency in a Stratospheric balloon design challenge (CAN-SBX) and was in charge of creating safety procedures for balloon retrieval and helping assemble the system. I was part of the Attitude Determination Control Systems (ADCS) team where I learned how to design a PCB that connected a reaction wheel to the main computer. I also designed a magnetorquer system for attitude control.

SOAR Peer Ambassador
I was a summer orientation leader in charge of creating and facilitating a variety of activities for the incoming first-years to get to know their peers during orientation. I spoke in student panels answering questions from incoming students, and their parents/supporters. I represented the faculty of engineering when interacting with attendees, often answering questions about the program. I ensured everyone felt safe and comfortable, often helping calm students who were in mild distress.

I have also taken a variety of classes relevant to my research interests such as quantum mechanics, solid-state devices and particle physics. My engineering physics degree has also strengthened my time management, report writing and critical thinking skills. A relevant course I took is ENPH 353 where my team wrote a paper on the wettability of ferrofluids which was chosen to be published in the Journal of Undergraduate Engineering Physics and Physics Experiments at Queen's (JUEPPEQ). It is currently awaiting review.

STATEMENT OF INTEREST

Please enter your statement of interest in the space provided below:
I want to advance my skills and knowledge as a scientist and I believe Queen's is the ideal place to do innovative research while growing professionally and personally. Throughout my undergraduate degree, I have developed a strong passion for research. I want to apply all aspects of my engineering degree to my career and deliver the best work possible. Applying these skills and knowledge to something tangible and impactful is my ultimate goal as I am hardworking and always up for a challenge.

The Masters of Applied Science (MASc) program is appealing to me as it integrates coursework and research. This program seems to encourage critical and innovative thinking; which is something I enjoy doing and would like to continue working on. Over the course of my degree I have found there are many solutions to the same problem, and finding the best one has been my goal when working on any project. The coursework aspect adds some structure to the program, but it still allows us to explore different things independently. I believe I have the necessary skills to succeed in the program as I am a hardworking student and always up for a challenge.

I also enjoy working as part of a team with like-minded individuals as I think that is an excellent way to become immersed in a subject area. So far from my experience at Queen's, I have seen that there is a strong sense of community, which I really like. It seems like everyone wants to help each other succeed at whatever the endeavour is. The environment seems to be very collaborative and supportive, which helps affirm that the endeavour is not a solitary one. In all the projects I have worked on, I have found that the ones with the best results are those in which I have a good team even when the work being done is independent.

I would like to pursue research at Queen's as it is an excellent school and I would like to contribute to the science being conducted here. The different research positions I have held and the different research classes have allowed me to take a glimpse into the world of graduate studies and research, and it is with certainty a place where I belong. I am excited at the prospect of furthering my academic and career pursuits at Queen's.

GRADUATE PROGRAM QUESTIONS

1. **We strongly encourage international applicants to take the Physics GRE subject exam. Please provide the following: GRE Subject Date, GRE Subject Score and % below.**
   N/A

2. **What type of Physics are you interested in? Theory, Experiment or Both?**

   I am interested in both theoretical and experimental physics. My undergraduate degree has made me appreciate both sides of physics.

3. **Which areas of Physics would you like to do graduate work in? Astronomy & Astrophysics, Condensed Matter Physics, Engineering & Applied Physics, General Relativity, Medical Physics, Particle Physics, Optics & Photonics. (choose as many as apply)**
   I would like to do graduate work in optics and photonics as I find the field interesting. More specifically, I would like to do work in quantum nanophotonics. I also find the field of astroparticle physics interesting.

4. **Where did you hear about Physics graduate research at Queen's?**

   I knew about the graduate research program when I applied to Queen's for undergrad, but I learned more about it in the information session hosted by Professor Vincent.