

# Fulbright Affiliation

Patryk Kozlowski

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## 1 Your Questions

*What time period specifically would we be looking at here?*

I would be applying for the 2024-2025 academic year.

*Would you expect to be formally registered in the King's MSc program?*

I would be formally registered in and will apply to the King's Physics MSc program.

### 1.1 Is there anything else you want to know about Fulbright?

I have a working knowledge of the application process, so I could answer questions if you have any.

## 2 Statement of Grant Purpose

This is the two-page statement where I argue to the committee why they should fund this graduate program for me. In their own words, *This 2-page document outlines the Who, What, When, Where, Why, and How of what you are proposing for your Fulbright grant.* There might be, for example, a biologist reviewing my application, so it needs to be written in laymen's terms.

## 2.1 Research Project

This is a compulsory module for the Physics MSc program. Do you have any ideas about what a research project could look like for me? Before I had the stroke, I was very much poised to complete a research project in electronic structure for the summer before my senior year. I had a little break from academics because of my medical situation, and this summer I am still spending a lot of my time on rehabilitation. But I have discovered my ability to do voice coding around half a year ago, and since then I have been working a little on the Full Configuration Interaction (FCI) project that I mentioned to you in my initial email.

### 2.1.1 FCI

*Namely, This summer, I have been working on implementing and optimizing Full Configuration Interaction for a H6 chain. I started by implementing the Slater-Condon rules, then I implemented the Davidson method, instead of just using NumPy for diagonalization. Now, I am working on the algorithm that was outlined in the Handy and Knowles 1984 paper.*

### 2.1.2 Senior Thesis

This summer, I will continue working on this FCI project, and then next academic year, I will be doing a senior thesis with Professor garnet Chan, presumably in electronic structure. So by the time I come to you in the 2024-2025 academic year, I will hopefully have more experience in electronic structure :) However, while I am working on the essay this summer, I need to have a decent idea for the research project that I want to do then, so I can explain it to a general audience.

### 2.1.3 sustainability

More broadly, I am interested in applications relating to sustainability. I have experience carrying out calculations of surface energies for heterogeneous catalysis. However, my understanding is that the applications of electronic structure to materials science, and thus to sustainability, are plentiful and I don't think we talk about this part.

## 2.2 Coursework

I have done some browsing of the King's College Physics graduate program website, but could you connect me with one of your PhD students so that they could advise me on what coursework would be most beneficial for me to take?