

# Cover Letter

**So Chigusa**

To whom it may concern,

I would like to inquire whether there is a postdoctoral position in theoretical particle physics at Duke University starting in Fall 2020. I am currently a graduate student at the University of Tokyo and going to finish my Ph.D. in March 2020.

I am an energetic researcher who enjoys working with people on a broad range of topics. So far, I have been working on several aspects of the phenomenology of the standard model of the particle physics and beyond. Firstly, I studied the stability of the electroweak vacuum and gave a proper calculation framework of the next-to-leading order decay rate of the vacuum. Secondly, I proposed and analyzed several methods to efficiently search for the supersymmetric partners of gauge bosons using future hadron colliders and evaluated their ability to discover a new particle and to measure its properties. More recently, I obtained a severe constraint on the parameter space of the very light axion-like dark matter using the rotation of the polarization plane of the light emitted from astrophysical sources. I also considered the cosmological and experimental constraints on models with flavor symmetry and grand unified theories. In the future, I want to keep seeking a trace of the new physics using the rich knowledge of phenomenology I have acquired during my Ph.D. course.

So I wish to be a postdoctoral fellow at your group and continue my research. I have asked recommendation letters to the following researchers which will be directly sent to you:

- Prof. Takeo Moroi (Department of Physics, University of Tokyo)
- Prof. Koichi Hamaguchi (Department of Physics, University of Tokyo)
- Prof. Kazunori Nakayama (Department of Physics, University of Tokyo)

Please find attached my C.V., research statement, and list of publications.

I am looking forward to hearing from you.

Sincerely yours,

So Chigusa