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To whomever it may concern

I am a research scholar at the Harish-Chandra Research Institute, India pursuing a doctorate in physics in the theory of high energy interactions of elementary particles. I expect to receive my doctorate in Physics in the year 2013. In particular, my present research work, under the supervision of Prof. Raj Gandhi, concerns the interactions of neutrinos, which are the lightest particles known to man, having essentially almost zero mass, at the extremely high energies, energies way more than what we can generate at our earthly labs – the particle colliders. Most of the particles, not least the neutrinos, at these energies stream to the earth from dense astrophysical sources where they are produced due to the simultaneous presence of incredibly high electric and magnetic fields, and temperatures. My work specifically relates to the implications for fundamental physical interactions when neutrino events are seen at the IceCube — a 1 Km<sup>3</sup> giant neutrino detector built into the ice-bed at Antarctica specifically with the objective of detecting these highly energetic neutrinos possibly coming from extra-galactic sources and completed only as recently as in Dec. 2010 — in the future.

The study of neutrinos and their interactions at the highest energies expected in the universe has been a challenge, one thoroughly engrossing and enlightening. Apart from the obvious inputs from the theory of elementary particles and their interactions, my studies have required computation skills to, among others, analyse large matrices in several dimensions, and solve differential equations and integration over several dimensions by the so-called Monte-Carlo methods. Such requirements have honed both my theoretical knowledge and programming skills, and the general knack of problem solving. I believe that the rigours of pursuing a doctorate in high energy neutrino physics, thus, stands me in good stead, equipped to apply the skills I have acquired toward solving a variety of problems.

I thank you for taking the time to consider my application.

Sincerely yours,

Atri Bhattacharya