

Dimitri Schritt
Department of Physics and Astronomy
University of Canterbury, Private Bag 4800
Christchurch, NZ
E-mail: dimitri.schritt@pg.canterbury.ac.nz



2nd February 2013

Professor Gustavo C. Branco
Centro de Fisica Teorica de Particulas
Instituto Superior Tecnico
Av. Rovisco Pais
P-1049-001 Lisboa, Portugal

Dear Professor Branco:

I am writing to apply for the postdoctoral position in theoretical particle physics at the Centro de Fisica Teorica de Particulas of the Instituto Superior Tecnico. Currently I am a Ph.D. candidate in the Department of Physics and Astronomy at the University of Canterbury. My dissertation, which I expect to defend in the first quarter of 2013, focusses on the following two topics in particle physics: dark matter and massive bosonic quantum field theories of higher spin.

My dark matter research has thus far been focussed on Elko, a spin one-half dark matter candidate. Together with my collaborators, I was able to show that the associated quantum field is Lorentz violating. This result is published in Physical Review D and in Physics Letters B. In future work I intend to further explore the phenomenology of Elko and to look for possible means of detecting the Elko particle in the LHC.

In my work on massive bosonic quantum field theories of higher spin, I was able to show that it is possible to construct a quantum field theory with a spin two degree of freedom that is renormalisable and unitary at all energies by including two further spin degrees of freedom, namely, spin one and spin zero. I know of no other viable spin two quantum field theory with exception of realisations in the context of supersymmetry. A paper on the spin two theory is presently in preparation for submission to JHEP. I intend to explore the phenomenological properties of the new quantum field and to employ the techniques developed in the derivation of this theory toward the derivation of other theories of higher spin.

Enclosed is a copy of my curriculum vitae which includes a list of publications. I will arrange for recommendations to be sent by email. Please advise if you require any additional information.

Thank you for your consideration. I look forward to hearing from you.

Sincerely,

Dimitri Schritt

Enclosures: Curriculum Vitae