

## The Institute for Theoretical Particle Physics

January 23, 2020

KARLSRUHE INSTITUTE OF TECHNOLOGY  
KARLSRUHE, GERMANY

### Application for PhD position

Dear Professor Nierste,

### About Me

---

I am currently a fourth year student at the University of Durham studying Theoretical Physics (MPhys). I have spent the previous years focusing on particle physics, through studying courses such as Relativistic Quantum Mechanics, Gauge Field Theories, and Nuclear and Particle Physics. During my third year, I began looking into the difficulties of understanding and predicting the behaviours of QCD in a project to model the inter-quark potential in quarkonia systems. My Masters thesis is still in progress, but in its preliminary stages, I have been testing the Two Higgs Doublet Model of Type II against flavour observables, finding constraints on its parameters. Through these courses and projects, I have developed a strong interest in the field of particle physics, flavour physics in particular. I am a very hard-working individual who will bring passion to my work and happily dedicate myself to my studies to the full extent of my abilities.

### Why the Institute for Theoretical Particle Physics ?

---

I believe the Institute for Theoretical Particle Physics would be a great place for me to continue my studies. The group's work in flavour physics and new physics extensions beyond the Standard Model aligns closely with what I have explored through my Masters program. I have read some of your publications on B physics and CP-violating processes with great interest. The extensive resources of Karlsruhe Institute of Technology and its frequent collaborations with other institutions across both Germany and the rest of the world would provide a great base to develop my skills and work alongside some of the leading experts in the world of flavour phenomena. I believe I could be a great addition to the team at the Institute for Theoretical Particle Physics and would very much enjoy the opportunity to take my next steps in physics with you.

### Why Me?

---

As I learn more and more about the mysteries of physics, there is one thing I can say with certainty: I need to know more. I know that what I have learned so far is just the tip of the iceberg, and I am so eager to continue my learning. I am a hard-working, dedicated student who is ready and willing to begin the intensive study and research of a PhD course. I will bring the strong communication skills and enjoyment of collaborative work that are very important to academic research. Critical thinking is another important aspect which is crucial in performing research and understanding fundamental physics; this is a skill I have used across many disciplines of my life and will apply this skill to all my future pursuits in science. The opportunity to continue my studies and begin to contribute towards the expansion of scientific knowledge would be something most valuable to me, and I would relish the chance to dedicate myself fully to this through a PhD position at the Institute for Theoretical Particle Physics.

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

Sincerely,

**Matthew Rossetter**

*Attached: Curriculum Vitae, Academic Transcript, Masters Abstract*