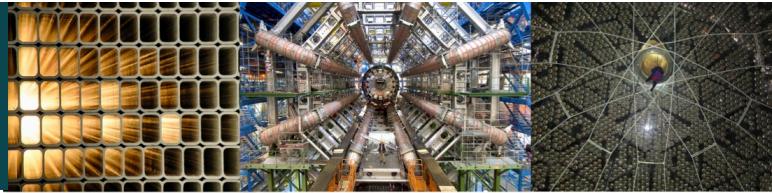




University of Sussex



PhD studentship on measuring top quark and Higgs boson interactions with ATLAS

<http://www.sussex.ac.uk/epp/>

Probing the Higgs boson, the most recently discovered fundamental particle, and one unlike anything else in the Standard Model (SM), is a critical priority in the search for new physics at the LHC. The Higgs boson is responsible for giving fundamental particles their mass and has the strongest interaction with the largest mass particles. The top quark is the heaviest fundamental particle in the SM and therefore has the strongest coupling to the Higgs. This makes LHC collisions where a Higgs is produced with a top-quark pair ($t\bar{t}H$) one of the most exciting places to look for signs of new physics. The candidate will play a leading role in new differential measurements of $t\bar{t}H$. This will provide fresh sensitivity to the top quark-Higgs interaction and the Higgs boson's interaction with itself that will lead to world-leading sensitivity to new physics. The importance of this work goes beyond understanding the Higgs boson. The interplay between the strength of the Higgs interaction to the top quark and with itself is directly related to the stability of the Universe at a quantum level and is a vital piece in the understanding of our existence. The ATLAS-Sussex group has made significant contributions to measurements of $t\bar{t}H$, $t\bar{t}W$ and $t\bar{t}Z$ production in multi-lepton final states performed so far in ATLAS: profiting from this experience in the group, the candidate will be ideally positioned to make large impact in this sector, also through close contact with CERN-based experts.

Funding is available for a September 2021 start which includes a tax-free bursary (expected to be £15,560 per annum in 2021/22) and fees for 3.5 years at the home-student level. UK students are eligible for home tuition fees, as are EU students with settled or pre-settled status under the [EU Settlement Scheme](#). Outstanding students not eligible for home fees will be considered for a partial tuition fee waiver above that level. Interviews of shortlisted candidates will be held in February and March initially and will continue until positions are filled. Applications from self-funded students interested in available projects are also welcome at any time of the year.

For more details about the project, please contact Dr. Josh McFayden:
J.A.McFayden@sussex.ac.uk.

For practical questions about applications and/or eligibility for funding, please contact
mpsresearchsupport@sussex.ac.uk

For academic questions please contact the coordinator of EPP PhD admissions, Dr. W. Clark Griffith: W.C.Griffith@sussex.ac.uk

Applications: <https://www.sussex.ac.uk/study/phd/apply>

Please state in the Finance section of the online form that you are applying for the EPP-McFayden studentship.