Dr Alexander Shires

I am a highly motivated physicist with five years' experience of contributing to the LHCb collaboration at CERN. My research is focussed on searching for physics beyond the standard model in $b \to s\ell^+\ell^-$ decays.

Education

Oct 2013 **PhD, High Energy Physics**, *Imperial College London*, UK.
Thesis: *Exploring $b \to s$ electroweak penguins at LHCb*, Supervisor: Prof. Ulrik Egede
Research PhD searching for physics beyond the Standard Model on the LHCb experiment at CERN.

Jun 2009 **MSci (Hons), Physics With Theoretical Physics**, *Imperial College London*, UK.
First Class degree concentrating on the theoretical aspects of physics, specifically to understand current research into particle physics and cosmology. This four year course involved specific modules in applied mathematics, statistics and computing dedicated to implementing algorithms for modelling and data analysis.

Aug 2005 **A-levels, GCSEs**, *Hardenhuish School*, Wiltshire, UK.
A-levels: Physics (A), Mathematics (A), Chemistry (A), Further Mathematics (A).
GCSEs: 3 A*, 3 A, 3 B.

Skills

Key skills: Physics, Data Analysis, Programming

Computing: C++, Python, Fortran
Frameworks: ROOT, boost, gsl, numpy/scipy
OS: Linux, Windows
Tools: SVN, Git, MS Office, LaTeX, Vim
Languages: English, German
Additional: Full, clean UK driving licence

Professional Experience

2013 to present **Post doctoral researcher**, *Technische Universität Dortmund*, Germany.
Post-doctoral position as an experimental researcher working on data from the LHCb experiment. My first project tested lepton universality, where I developed new models to describe the data, implemented the calculations in a coherent framework and brought the result to publication. Alongside this, I initiated a collaboration with the theory department to produce a prediction of the $K\pi$ S-wave contribution to the $B^0 \to K^{*0}\mu^+\mu^-$ decay.

- In the first twelve months delivered two high quality publications, one experimental measurement and one theoretical prediction.
- Subsequent placement at CERN for three months to contribute to the LHCb trigger system.
- Supervised MSc and BSc students for their undergraduate projects as well as giving lectures and tutorials.

Jan 2012 – Apr 2013 **PhD student**, *Imperial College London*, UK.
Published the second measurement of the angular distribution of $B^0 \to K^{*0}\mu^+\mu^-$ at LHCb and set up the first measurement of the $K\pi$ S-wave contribution to the $B^0 \to K^{*0}\mu^+\mu^-$ decay.

Aug 2010 – Dec 2011 **PhD student**, *CERN*, Switzerland.
Placement as part of my PhD studentship, lived in Geneva and worked at CERN. Produced on the first measurement of the angular distribution of $B^0 \to K^{*0}\mu^+\mu^-$ at LHCb, developed the trigger software for LHCb and participated in the running of the LHCb experiment during data-taking in 2011.

Ostenhellweg 56 – 44135 Dortmund – Germany
+49 (173) 690 9175 • +44 (7799) 823 210 • a.shires@gmail.com
AlexanderShires • alexshires

Summer 2008 **Undergraduate research placement**, *Imperial College London*, UK.
Developed and integrated autonomous remote testing for the Ganga project. Added reporting options to show test failure differences between different versions.
- Worked with established software framework as part of a small team to implement the required improvements.

Summer 2006 & 2007 **Junior engineer**, *Westinghouse Rail Systems*, Wiltshire, UK.
As a scholarship given to the best 3 students from local schools, worked as the sole data analyst for the first live railway trial of a multi-million pound project. Invited back for a second year to develop software to test the integration of a new railway track-side communications protocol.

Publications

D. Das, G. Hiller, M. Jung, and A. Shires, *The $\overline{B} \to \overline{K}\pi\ell\ell$ and $\overline{B}_s \to \overline{K}K\ell\ell$ distributions at low hadronic recoil*, JHEP **09** (2014) 109, arXiv:1406.6681

LHCb collaboration, R. Aaij *et al.*, *Test of lepton universality using $B^+ \to K^+\ell^+\ell^-$ decays*, Phys. Rev. Lett. **113** (2014) 151601, arXiv:1406.6482

LHCb collaboration, R. Aaij *et al.*, *Differential branching fraction and angular analysis of the decay $B^0 \to K^{*0}\mu^+\mu^-$*, JHEP **08** (2013) 131, arXiv:1304.6325

T. Blake, U. Egede, and A. Shires, *The effect of S-wave interference on the $B^0 \to K^{*0}\ell^+\ell^-$ angular observables*, JHEP **03** (2013) 027, arXiv:1210.5279

LHCb collaboration, R. Aaij *et al.*, *Differential branching fraction and angular analysis of the decay $B^0 \to K^{*0}\mu^+\mu^-$*, Phys. Rev. Lett. **108** (2012) 181806, arXiv:1112.3515

Additional author on more than 200 papers as a member of the LHCb collaboration.

Invited Talks

Test of lepton universality using $b \to s\ell^+\ell^-$ decays at LHCb, Collider cross talk, CERN, Sept, 2014

Rare heavy flavour decays at the LHC, Frontiers in Particle Physics, Aspen, Jan, 2014

Additional regular seminars at UK and German institutions

.

References

Available on request

Ostenhellweg 56 – 44135 Dortmund – Germany
+49 (173) 690 9175 • +44 (7799) 823 210 • a.shires@gmail.com
AlexanderShires • alexshires