Dr Alexander Shires

A highly-motivated physicist, I have five years' experience of contributing to the LHCb collaboration at CERN whilst working at Imperial College London and Technische Universität Dortmund. My research is focussed on searching for physics beyond the standard model in $b \to s\ell^+\ell^-$ decays.

Key Skills Physics, Statistics, Data Analysis, Programming

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

Professional Delivered multiple high profile results during my PhD and post-doctoral position, working over timescales ranging from a few months to several years. Record of successful collaboration with multiple researchers across Europe in a highly matrix environment. Requested by the lead physicist in LHCb to independantly review a critical project and delivered a thorough review ahead of schedule. As the sole post–doctoral researcher at my current position, I set a professional example to the post-graduate students. Communication of my work is vital to it's success and I have strong public presentation skills, developed while leading discussions at a number of top academic institutions across Europe.

Software Designed and implemented software across the LHCb collaboration, from local scripts to production code in the LHCb software trigger, used by multiple research groups and required by the entire collaboration. Regularly implement effective code to deliver results with a scalable and maintainable ethos.

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

Professional Experience

June 2013 to present **Post doctoral researcher**, *Technische Universität Dortmund*, Germany.
Post-doctoral position as an experimental researcher working on data from the LHCb experiment. In my first sole project I developed new models from scratch 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 a previously unknown quantity, vital for future research in my area. Subsequent placement at CERN for three months for on-site software development to prepare to the reactivation of the LHC. On my return to Dortmund, I brought two more long term projects to fruition.

Jan 2012 – Apr 2013 **PhD student**, *Imperial College London*, UK.
Delivered one result in a small team and started a second as a sole project whilst writing my thesis.

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Aug 2010 – Dec 2011 **PhD student**, *CERN*, Switzerland.
Placement as part of my PhD studentship, lived in Geneva and worked at CERN. Produced the first measurement of my PhD on the first data from the LHC, developed software vital to the running of the experiment and participated in the running of the LHCb experiment during data-taking in 2011.

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

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

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References

Available on request

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