

Greig A. Cowan

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I have fifteen years experience at the leading edge of scientific research in high-energy particle physics at the CERN Large Hadron Collider. I currently lead international teams of scientists within the 800-strong "LHCb" collaboration in the analysis of massive datasets collected at the LHC, using custom-developed software and machine learning algorithms. I am now searching for a new opportunity in the commercial sector where I can apply my excellent leadership, technical and communication abilities to a novel set of challenges.

Career

- **University of Edinburgh** **UK**
STFC Ernest Rutherford research fellow 2013–2018
- **École Polytechnique Fédérale de Lausanne** **Switzerland**
Research scientist 2010–2013
- **University of Edinburgh** **UK**
Research scientist 2005–2010

Education

- **University of Glasgow** **UK**
Ph.D. Theoretical Physics. Thesis: "Colour superconductivity" 2001–2005
Thompson prize for research
- **University of Glasgow** **UK**
M.Sci. Mathematics and Physics, 1st class 1997–2001
Mathematics/Physics class prizes in years 1-4

Key Skills

Leadership

- **LHCb-UK physics coordinator:** 2014–2018
This elected position role requires liaising between research institutes, the preparation of funding applications, organisation of an annual meeting (approx. 100 participants), publishing news articles (www.lhcb.ac.uk) and interacting with the media. Through this role I have helped to win over £5M of research funding.
- **LHCb physics group leader:** 2012–2014
I managed a distributed group of approximately 40 physicists (students to senior professors) to successfully deliver a series of scientific measurements/publications using the latest LHC data. I acted as the liaison between the group and the senior management of the collaboration.
- **LHCb data processing coordinator:** 2010–2011
I was responsible for the World-wide data processing of the collaboration. This operations role sat between the experimental hardware, the distributed computing infrastructure and the end-user analysts.

○ **Distributed computing deployment/operations:** 2005–2010

I led the international deployment, commissioning and operations of the distributed computing/storage infrastructure for the LHC. This is used to transfer, process and store all raw and derived data from the CERN experiments.

Data analysis and software.....

○ **Senior analyst:** 2014–2018

The LHCb experiment at CERN produces huge quantities of data that can be mined to perform measurements of fundamental physics quantities. I have led teams of physicists in the different stages of data preparation, distributed processing, machine-learning based classification and regression. This uses a custom-built software framework combining C, C++ and python, tested using the CERN-based continuous integration system.

○ **Lead developer:** 2010–2018

I was lead developer (in a small team) of a C++ event simulator application (github.com/gcowan/RapidSim) that is regularly used within the LHCb collaboration to gain insight on particular data analysis tasks. Previously, I led the development of a C++ model fitting application (github.com/gcowan/RapidFit) that served as the foundation to multiple physics measurements using LHCb data.

○ **Machine learning:** 2014–2018

Machine-learning is now being used through all stages of the scientific discovery process, both for event classification and for measurement through regression algorithms. My latest project is leading a small team in the development of a new tool based on the Google TensorFlow package, which aims to significantly speed-up our complex multi-dimensional data analyses.

○ **Systems administration:** 2005–2009

When commissioning the LHC distributed computing infrastructure I developed expert-level knowledge of the SQL-based databases systems, low-level networking protocols and Linux systems administration.

Communication.....

○ **Lead publication author:** 2001–2018

I have authored numerous scientific papers (approx. 2-3/year) that have been published in leading high-energy physics journals. I am in the final stages of writing a short online book for the Institute of Physics to describe my research to a less expert audience.

○ **Public speaking:** 2001–2018

I am regularly invited to present my research at leading international conferences (approx. 4/year) and have organised several conferences/workshops in Europe to discuss the latest scientific advances. I frequently present my ongoing technical work to my international collaborators via conference calls and in person at CERN.

○ **Public outreach:** 2001–2018

In 2016 I co-organised the week-long "Antimatter matters" exhibit at the Royal Society in London (antimatter-matters.org) that reached over 10000 visitors. I currently operate a service for high schools to access kits that demonstrate basic particle physics principles.