

**CURRICULUM VITAE Dr Victoria J Martin**

January 2016

**CURRENT POSITION**

I am a **Reader in Particle Physics in the School of Physics & Astronomy, University of Edinburgh.**

In my job, my current roles include:

- Leader of the ATLAS Experiment research group at the University of Edinburgh
- Co-Chair, RSE Young Academy of Scotland
- Chair, Science and Technology Facilities Council Project Peer Review Panel

I am actively involved in public engagement: I have given public lectures and have contributed to Scottish and UK print & broadcast media. I also work with school teachers and the National Museum of Scotland in Edinburgh to inform young people about particle physics.

**CAREER**

**Aug 2013 – present** Reader, School of Physics & Astronomy, University of Edinburgh.

**July 2015 – July 2016** Sabbatical; based at CERN.

**Oct 2005 – July 2013** Lecturer, School of Physics & Astronomy, University of Edinburgh.

**Aug 2008 – Aug 2009** Maternity leave.

**Oct 2000 – Aug 2005** Postdoctoral Research Fellow, Northwestern University, IL, USA

**UNIVERSITY EDUCATION**

**1996 – 2000** Doctoral research in Experimental Particle Physics at the University of Edinburgh. Awarded PhD, December 2000.  
Thesis title: *Measurement of the Direct CP Violation Parameter  $Re(\epsilon'/\epsilon)$ .*

**1992 – 1996** Study in Mathematical Physics at the University of Edinburgh.  
Awarded BSc(Hons) in Mathematical Physics, July 2000.

## RESEARCH INTERESTS

My research field is experimental particle physics, examining the particles and forces that exist at the smallest accessible length scales. I am a member of two international collaborations of particle physicists. My main activity is the ATLAS experiment collaboration at the Large Hadron Collider at CERN. ATLAS is one of the two experiments that discovered the Higgs boson in 2012. I also participate in the International Linear Collider (ILC) and Compact Linear Collider (CLIC) projects. The ILC and CLIC projects investigate and develop techniques for potential future high energy electron-positron collider. Through both my collaborations with ATLAS, CLIC and ILC my current focus is Higgs boson physics: I have developed techniques to identify and better measure Higgs boson decays, and investigate the potential of future experiments to measure the Higgs boson and other phenomena.

Previously I have worked on the CDF experiment at the Tevatron Collider at Fermilab and the NA48 experiment at CERN.

Below I have listed my major roles within each of the collaborations.

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|-----------------------|---|
| <b>2009-present</b>   | <p><b>ATLAS Collaboration, CERN</b></p> <p><b>Edinburgh Team Leader, 2012-present:</b> current team consists of 3 academics, 7 researchers and 7 PhD students.</p> <p><b>Deputy Team Leader, 2009-2012</b></p> <ul style="list-style-type: none"> <li>- <b>Co-Leader</b>, Higgs Prospect analysis group 2015 - 2016</li> <li>- Physics and trigger research to support ATLAS Upgrade proposal</li> <li>- Member of the Atlas speakers committee, 2015 - 2018</li> <li>- Higgs boson searches with <math>H \rightarrow b\bar{b}</math>, 2010 - 2015</li> <li>- Internal reviewer for <math>t\bar{t}H</math> and <math>W+b</math>-jet production analyses, 2012</li> <li>- High Level Trigger project, 2011 - present</li> <li>- Trigger software validation 2011 - present</li> <li>- ATLAS Simulation software team, 2009 - 2011</li> </ul> |
| <b>2002 - present</b> | <p><b>International Linear Collider (ILC) and CLIC projects</b></p> <ul style="list-style-type: none"> <li>- <b>Leader</b>, Edinburgh ILC group, 2006 - present</li> <li>- Analysis of Higgs boson branching ratio and <math>t\bar{t}H</math> production</li> <li>- LCFI flavour tagging and vertexing analysis group, 2006 - 2008</li> </ul>   |
| <b>2000 - 2008</b>    | <p><b>CDF Experiment, Fermilab</b></p> <ul style="list-style-type: none"> <li>- <b>Leader</b>, CDF muon reconstruction group, 2001 - 2005</li> <li>- <b>Co-leader</b>, CDF single <math>W</math> and <math>Z</math> boson group, 2004 - 2005</li> <li>- Tevatron Electroweak Working Group, 2003 - 2005</li> <li>- CDF software task force, 2002 - 2005</li> <li>- CDF muon detector calibrations coordinator, 2001 - 2005</li> </ul>   |
| <b>1996 - 2000</b>    | <p><b>NA48 Experiment, CERN</b></p> <ul style="list-style-type: none"> <li>- NA48 <math>\text{Re}(\epsilon'/\epsilon)</math> analysis, 1997 - 2000</li> <li>- Future program <math>K_{S,L} \rightarrow \pi^0 \nu\bar{\nu}</math> study group, 1999</li> </ul>   |

## RESEARCH GRANTS

Experimental particle physics is an inherently collaborative endeavour therefore the majority of my grants are co-applications with collaborators in the University.

- **2015: Co-Investigator, Particle Physics Experiment Consolidated Grant.** Awarded £2.4million by STFC. This grant funds the majority of the particle physics research at the University, including 5 PRDAs for ATLAS research,
- **2012: Co-Investigator, Atlas UK Upgrade Proposal,** awarded £785k by STFC to fund 4 researchers for ATLAS research.
- **2012: Co-Investigator, Particle Physics Experiment Consolidated Grant.** Awarded £2 million by STFC. This grant funded 4 PRDAs for ATLAS research
- **2011: Principal Investigator, Atlas UK Upgrade Proposal.** Awarded **£220k** from STFC. Funding for 2 PDRAs for ATLAS Upgrade research
- **2010: Co-Investigator, Experimental Particle Physics** Awarded **£920k** by STFC.
- **2009: Co-Investigator, Experimental Particle Physics** Awarded **£410k** by STFC.
- **2006: Co-Investigator, Experimental Particle Physics at the University of Edinburgh** Awarded £2.3million by STFC.
- **2006: Principle Investigator, Marie Curie International Reintegration Grant,** awarded **€80k** by FP6. Used to bootstrap ILC research at the University of Edinburgh.

## RESEARCH SUPERVISION

I have supervised 11 PhD students (7 as first supervisor, 4 as second supervisor) and 8 MPhys and MSc project students.

### PhD Students, University of Edinburgh

- **Principal supervisor for 3 current students:** Alan Taylor (ATLAS, 2015 - ); Tim Bristow (ATLAS, 2012-); Paul Glaysher (ATLAS, 2012-),
- **Principal supervisor for 4 former students:** Manuel Proissl, (ATLAS, 2011-2015, graduated 2015); Ben Smart, (ATLAS, 2010-2015, graduated 2015); Brendan O'Brien, (ATLAS, 2009-2014, graduated 2014) Hajrah Tabassam (ILC, 2007-2011, graduated 2012).
- **Second supervisor (4 students):** Xante Hoad (ATLAS, 2014 - ); Tony Price, visiting PhD student from University of Birmingham (ILC physics studies, 2011-12); Fransisca Garay (ATLAS, 2011-); Karoline Selbach (ATLAS, 2010-2013).

### MPhys Project students, University of Edinburgh

- Alan Taylor (CLIC Physics, 2014-15); Jonathan Rosten (CLIC Physics, 2012-13); Richard Smith (ILC Physics, 2011-12); Natalia Glowa (ATLAS Physics, 2010-11); Ben Smart (ATLAS Simulation, 2009-10); Alex Urquhat-Taylor (ILC, 2007-08)

### MSc Project students, University of Edinburgh

- Andrew Thornbury (CLIC Physics, 2015); Théo Galy-Fajou, visting MSc student from EPFL Lausanne (CLIC Physics, 2014-15)

**ACADEMIC EXPERIENCE**, University of Edinburgh**TEACHING:**

- **MPhys Project Coordinator**, 2010 – 2015.
  - Coordination of around MPhys projects for final year students, around 30-40 students each year.
  - Development & implementation of new core course for all final year MPhys students: MPhys Project Presentation course.
- **Undergraduate Lecture Courses, School of Physics & Astronomy**
  - Physics 1B, 2015. Lectures and tutorials on introductory quantum physics
  - Particle Physics, 2011-2015. Lectures and tutorials on advanced experimental particle physics
  - Subatomic Physics, 2007-2010. Lectures and tutorials on introductory particle physics.
  - Physics 2B, 2006-2010. Lectures and workshops on waves and laboratory supervision.
- Supervision of group projects, 2009 - 2015.
- **MOOC: *The Discovery of the Higgs Boson*** ([futurelearn.com/courses/higgs](http://futurelearn.com/courses/higgs)), 2013–2016
  - Lectures on experimental physics.
- **Graduate lecture courses, SUPA graduate school**
  - Development of particle physics curriculum, 2006-07.
  - Collider Physics, 2006-2012. Creation of course, lecture, tutorials and course organisation.

**ADMINISTRATION:**

- School of Physics & Astronomy **Director of Quality** (formerly Quality Assurance Officer), 2009 - 2015. Responsible for implementing & monitoring procedures to assure the School's teaching and assessments are of the required standards.
- **PhD Student Recruitment and Coordination** for Particle Physics Experiment group. Advertising PhD positions, managing funding, interviewing and selecting applicants.
- **Personal Tutor** (formerly Director of Studies) for around 50 undergraduate students, 2007- 2015.
- College of Science & Engineering Quality Assurance Committee, 2009 - 2015
- College of Science & Engineering Library Committee, 2009 - 2015

**APPOINTMENTS AS EXTERNAL EXAMINER**

- November 2015, External Examiner, PhD, Royal Holloway, University of London.
- January 2015, External Examiner, MSc, EPFL Lausanne, Switzerland.
- June 2014, External Examiner, PhD, University of Liverpool.
- August 2012, External Examiner, MSci, University of Glasgow.
- March 2011, External Examiner, DPhil, University of Oxford.

## COMMUNITY SERVICE ROLES

As an active member of the research community in Scotland, and the particle physics community in the UK I have undertaken a number of roles in several organisations, which are detailed below.

### Science and Technology Facilities Council (STFC)

- **Chair, STFC Projects Peer Review Panel (PPRP)**, 2016 - 2017. *PPRP reviews all newly proposed projects in particle, astro-, particle-astro and nuclear physics and space science. PPRP recommends funding amounting to several tens of million pound each year.*
- Member, STFC PPRP, 2010-2011 and 2015-2017.
- **Member, STFC Ernest Rutherford Fellowship Panel**, 2014 – 2016. *This panel is responsibility for awarding up to 12, 5-year, fellowships annually to early-to-mid career researchers in the fields of particle physics, nuclear physics, accelerator physics and astrophysics.*
- **Member, STFC Particle Physics Advisory Panel (PPAP)**, 2014 - present. *PPAP advises STFC on behalf on the UK particle physics community.*
  - As a member of PPAP I have co-organised UK-wide particle physics community meetings in 2014 and 2015.
- **Member, STFC Particle Physics Users' Advisory Committee**, 2009 - 2012.

### RSE Young Academy of Scotland (<http://www.youngacademyofscotland.org.uk/>)

*The RSE Young Academy of Scotland (YAS) was established in 2011 to foster interdisciplinary activities among emerging leaders from the disciplines of science and humanities, the professions, the arts, business and civil society. YAS members are chosen by Selection Committees consisting of Fellows of the RSE.*

- Member, Young Academy of Scotland, 2014 - 2019
- Co-chair, Young Academy of Scotland, 2015 - 2016

### Royal Society of Edinburgh (RSE)

- Member, RSE events committee 2016 - 2019.
- Member, RSE SCIO, 2015-2018.

### Scottish Universities' Summer School in Physics

I have been involved in the organisation of three Scottish Universities' Summer School in Physics:

- 2012 Scientific Secretary for School on *LHC Physics*
- 2009 Scientific Secretary for School on *Physics at the LHC*
- 2006 Committee member for School on *Neutrinos in Particle Physics, Astrophysics and Cosmology*

## PRESENTATIONS AT INTERNATIONAL CONFERENCES, SCHOOLS & WORKSHOPS

- *LHC physics prospects for the forth-coming period at full energy & goals for the high-luminosity runs.* International Linear Collider Workshop, Belgrade, October 2014.
- *Searches for the Higgs boson into fermions at ATLAS* 43rd Rencontres de Moriond: Electroweak Interactions and Unified Theories, La Thuile, Italy. March 2013
- *Precision Higgs boson branching ratio measurements using  $t\bar{t}H$  at the ILC.* Co-authored with Hajrah Tabassam. International Linear Collider Workshops, Seville 2011 and Geneva 2010.
- *Searching for the Higgs at CDF.* International Linear Collider Workshop, DESY, Hamburg, Germany. June 2007
- Lectures on *Detectors for the ILC.* Second International Linear Collider Physics School, Ambleside, UK. September 2006.
- *First Measurements of Inclusive W and Z Cross Sections from Run II of the Tevatron Collider.* Meeting of the Division of Particles and Fields of the American Physical Society, Riverside, CA, USA. August 2004.
- *W and Z physics at CDF.* Les Rencontres de Physique de la Vallée d'Aoste, La Thuile, Italy. March 2004. Published in Results and Perspectives in Particle Physics 2004.
- *Charged Higgs Studies at a  $\gamma\gamma$  Collider, Progress with  $\gamma\gamma \rightarrow \gamma\gamma$  and  $\gamma\gamma \rightarrow ZZ^*$  in Pandora.* Linear Collider workshops, Cornell 2003; Arlington, TX, 2003 and Prague, 2002.

## SEMINARS AND PRESENTATIONS AT NATIONAL CONFERENCES & WORKSHOPS

- *Physics prospects at HL-LHC.* Higgs-Maxwell Particle Physics Workshop, Edinburgh February 2016.
- *But is it the Standard Model Scalar? Searching for Brout-Englert-Higgs boson to fermions at ATLAS* June 2015, IIHE, Brussels.
- *But is it the Standard Model Higgs boson? Searches for Higgs  $\rightarrow$  fermions at ATLAS,* April 2015, Bogazici University, Istanbul.
- *The Higgs boson, revealed!* University of Edinburgh, School of Physics & Astronomy General Interest Seminar, September 2012.
- *Electroweak Physics.* Plenary Presentation, Institute of Physics Conference, Lancaster, UK. Apr 2008.
- *The International Linear Collider.* Scottish Universities' Physics Alliance AGM, April 2007.
- *Electroweak Physics at CDF.* Presented at Universities of Edinburgh, Glasgow, Freiburg, Mainz and at DESY, Hamburg and MPI Munich, 2005.
- *CP Violation at NA48.* UK Phenomenology Workshop on Heavy Flavour and CP Violation, Durham, England, Sep 2000.
- *CP Violation at NA48.* Higgs-Maxwell Workshop on CP Violation, February 2000.
- *The NA48 Experiment.* Institute of Physics Conference, April 1999.

## PRESS APPEARANCES & ARTICLES

As an expert in particle physics, particularly on the Higgs boson and LHC research, I have represented the University and my collaborators in many appearances in print and broadcast media, both nationally and internationally. Links to the material can be found on my webpage: [www.ph.ed.ac.uk/~vjm](http://www.ph.ed.ac.uk/~vjm)

- June 2015: *LHC Run 2 begins!* Interview on BBC Radio Scotland
- April 2015: *LHC switches back on.* Interviews on BBC News 24, Channel 4 News, Radio Scotland
- September 2014: Scottish Sunday Mail feature article on me!
- 2014: Contributor to BBC Radio Five Live Bacon's Theory (6th Jan, 31st March & 8th Sep 2014)
- December 2013: BBC Radio 4 Broadcasting House Press Review (22nd December 2013)
- 8th October 2013: Nobel Prize in Physics 2013 for Peter Higgs and Francois Englert
  - Authored opinion pieces in the Scotsman and The Independent
  - PM programme, BBC Radio 4
  - Channel Five News
- Latest results on the Higgs boson: 14th March 2013, BBC Radio Scotland
- LHC at the Scottish Parliament: February 2013
  - STV News
  - Edinburgh Evening News
  - The Scotsman
- ITN News: What was so great about 2012?
- Yahoo News Review 2012
- Autumn 2012: *Piecing it Together*, University of Edinburgh Bulletin magazine.
- July 2012: **Discovery of the Higgs Boson!**
  - Interviewed for news reports on BBC Radio Scotland, BBC News 24, U.S. National Public Radio, STV News, Canada Global TV, Radio Forth, Sky News, Edinburgh Evening News and Japanese TV.
  - University of Edinburgh press conference with Peter Higgs.
  - My research was profiled in the Sunday Herald and EU Science Networks magazine.
  - Panel member on STV news evening news discussion.
- December 2011: Interviewed for BBC Radio 4 *Profile* program, profiling Professor Peter Higgs and his work.
- December 2011: *Soon we'll pinpoint that particle*, article in Edinburgh Evening News.
- December 2011: *Latest results in the Search for the Higgs boson.* Interviewed for BBC Radio 4 and BBC News 24.
- November 2011: Interviewed for Higgs boson research article, Die Tageszeitung, Berlin.
- September 2011: *Apparent observation of superluminal neutrinos.* Interviewed for news reports on BBC Radio 4 and BBC TV News 24.
- July 2011: BBC Radio Scotland *Shereen Nanjiani Show*: "Big Interview" segment on my Higgs boson research.

## PUBLIC OUTREACH TALKS & ACTIVITIES

### Events with teachers and school pupils:

- November 2015: Organiser of the *Particle Physics in the New Curriculum for Excellence*, a weekend workshop for Scottish school teachers. <https://indico.ph.ed.ac.uk/indico/conferenceDisplay.py?confId=14>
- May 2015: Presentations at St Columba's School, Kilmacolm
- December 2014: Presentation to Science Club, George Watsons School, Edinburgh
- September 2014: IOP Scotland Higgs boson prize giving, Royal Society of Edinburgh
- September 2014: Presentation at Fettes School, Edinburgh
- May 2014: Keynote talk, Scottish Institute of Physics Teachers' Conference
- April 2014: Presentations at Plockton High School
- March 2014: Presentations for National Science and Engineering Week, Grange Academy, Kilmarnock (my Alma Mater!)
- November 2012: Presentation to STEM Society, Craigmount High School, Edinburgh

### Public lectures:

- September 2015: *From Maxwell to Higgs, and Beyond!* with Alan Walker, Orkney Science Festival <http://oisf.org/event/from-maxwell-to-higgs-and-beyond/>
- June 2015: Public Lecture at the Royal Institution, London *Big Bucks for Big Bosons: Should we still be paying for the Large Hadron Collider?* <http://www.rigb.org/whats-on/events-2015/june/public-big-bucks-for-big-bosons-should-we-still-be-paying-for-the-large-hadron-c>
- June 2015: Public lecture, Alumni Weekend, University of Edinburgh
- May 2014: Public lecture, Royal Scottish Society of the Arts
- April 2014: Public lecture, Plockton Town Hall with Peter Higgs and Alan Walker
- November 2013: Public lecture, National Museum of Scotland
- October 2013: McMillan Memorial Lecture to Institution of Engineers and Shipbuilders in Scotland & Women's Engineering Society
- September 2013: Public lecture, Glasgow Café Scientifique
- June 2013: *An audience with Peter Higgs*, Public lecture with Peter Higgs, Edinburgh
- May 2013: *An audience with Peter Higgs*, Public lecture with Peter Higgs, Dublin
- March 2013: Public lecture, Dunbar Science Festival
- January 2013: Public lecture, Kilmarnock Engineering & Science Society

### Contributions to Outreach Exhibitions:

- Contributor and consultant to National Museum of Scotland on particle physics, ongoing.
- European Night of Researchers, National Museum of Scotland, September 2014: *The Higgs Boson and Beyond*
- Royal Society Summer Exhibition 2014: *The Higgs Boson and Beyond*
- Royal Society Summer Exhibition 2013: *Understanding the Higgs Boson*
- LHC at the Scottish Parliament, February 2013.
- Edinburgh International Science Festival, 2006 - ongoing: Exhibitor with Particle Physics for Scottish Schools