

# CV: William Thomas Ball

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Email: william.ball@maasmedia.co.uk

## CAREER HISTORY

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- 2015/Oct – Present **Visiting Lecturer and Postdoctoral Researcher, Institute for Atmospheric and Climate Science (IAC), ETH Zürich**
- 2014/Sept. – Present **Postdoctoral Researcher, PMOD/WRC, Davos**  
*Main foci: quantify influence of spectral solar irradiance variability upon atmospheric chemistry, temperature and dynamics, using 2D and 3D atmospheric models, observations and reanalysis data; investigate solar influence on climate; ozone trend analysis; development and application of improved trend and data analysis techniques in environmental sciences.*
- 2011/Sept. – 2014/Aug. **Postdoctoral Research Associate, Imperial College London**  
*Focus: magneto-hydrodynamic simulations of solar and stellar atmospheres, solar irradiance variability from days to centuries and its impact on the stratosphere.*

## EDUCATION

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- 2008/Sept. - 2012/Mar. **PhD: “Observations and Modelling of Total and Spectral Solar Irradiance”**  
Imperial College London, London, UK
- 2002/Oct. – 2006/Jun. **MSci (Hons) in Mathematics & Physics [2:1], University of Durham, Grey College**

## FUNDING

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- 2016/Oct. **Swiss National Science Foundation Grant: “Volcanic Eruptions and their impact on future Climate”** (VEC; SNSF\_200020\_163206); Proposal co-written by Dr W.T. Ball; P.I. Dr E.V. Rozanov; budget awarded: CHF 226 600
- 2015/Oct. **Swiss National Science Foundation Grant: “Study to determine Spectral Solar Irradiance and its impact on the middle atmosphere”** (SIMA; SNSF\_200021\_169241)  
Proposal co-written by Dr. W.T. Ball; P.I. Dr. E.V. Rozanov; budget awarded: CHF 347 000.
- 2014 **Short-Term Scientific Mission Award (STSM)** from the European Cooperation in Science and Technology (COST), “*Inverse solar cycle trends observed from the ground at visible wavelengths: are they real?*” Mission to Max Planck Institute for Solar System Research; COST-STSM-ES1005-13328; budget awarded: EUR 1000.

## AWARDS

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- 2016/Sept. Award for Best Presentation in the Natural Sciences section, *Graubünden forscht - Young Scientists Contest*, Davos, Switzerland
- 2016/Feb. Nominated for ‘*World Meteorological Organisation Research Award for Young Scientists 2016*’ by the Permanent Representative of Switzerland with the WMO.

## PUBLICATIONS

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*Publications are listed separately.*

**Peer-reviewed journal publications:** 8 first author and 13 co-authored

**Journal publications in review:** 1 first author and 2 co-authored

**Journal publications in preparation:** 2 first author

## TEACHING EXPERIENCE

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2015/16, 16/17, 17/18 **Lecturer, ETH Zürich**  
Radiation and Climate Change, Masters course; together with Prof. Dr. Martin Wild

2016/17 **Guest Lecturer, ETH Zürich**  
Klimasysteme, Undergraduate course, one lecture as a part of Prof. Dr. Reto Knutti's course.

2015 **Invited lecturer, International School of Space Science, L'Aquila, Italy**  
Heliospheric physical processes for understanding Solar-Terrestrial Relations (summer school)

2012/13 & 2013/14 **Teaching Assistant, Imperial College London**  
1<sup>st</sup> year undergraduate computing lab: Introduction to python

## **SUPERVISION EXPERIENCE**

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2015-17 **Supporting-supervisor, PhD, ETH Zurich & Charles Univeristy**  
Mr Ales Kuchar, "Attribution of 11-year solar cycle influence on middle atmosphere and its coupling processes"

2015-17 **Supporting-supervisor, PhD, ETH Zurich**  
Dr Pavle Arsenovic, "Influence of energetic electron precipitation on atmospheric chemistry and climate"

2014-16 **Supporting-supervisor, PhD, ETH Zurich & PMOD/WRC Davos**  
Dr. Timofei Sukhodolov, "Study of the middle atmosphere response to short-term variability"

2014 **Co-supervisor, Imperial College London**  
Undergraduate Research Opportunities Programme (UROP) summer student (8 weeks); investigating short term solar irradiance variability in data from the SORCE satellite.

2012/13 & 2013/14 **Supervisor, Imperial College London**  
1<sup>st</sup> year undergraduate projects (7 weeks); four students in total.

2012 **Co-Supervisor, Imperial College London**  
Masters research project; simulation of stellar spots using Kepler satellite data.

## **DEPARTMENT COMMITTEE POSITIONS**

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2016-Present **Representative for Atmospheric Chemistry Group, Postdoc & Senior Scientist Committee, IAC, ETH Zürich**

2012-2014 **Member, Research Associate Committee, Physics Department, Imperial College London**

2009-2010 **Chair, Postgraduate Committee, Physics Department, Imperial College London**

## **INTERNATIONAL COLLABORATIONS & WORKING GROUPS**

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2017-Present **Member, SPARC/LOTUS Working Group**  
Long-term Ozone Trends and Uncertainties in the Stratosphere (LOTUS).

2016-Present **Co-chair of SPARC/SOLARIS-HEPPA Working Group**  
"Methodological Analysis" for Solar Influences for SPARC (SOLARIS) - High Energy Particle Precipitation in the Atmosphere (HEPPA) Chemistry Climate Model-Initiative (CCMI) and Coupled Model Intercomparison Project 6 (CMIP6) solar signal detection.

2016-Present **Member, international collaboration to develop a Mars Chemistry Climate Model, PI: Laura Revell.**

2016-Present **Member, International Space Science Institute (ISSI), Working group**  
"Towards a unified solar forcing input to climate studies", PI: Natalie Krivova

2012-Present **Member, International Space Science Institute (ISSI), Working group**  
"An Assessment of the Accuracies and Uncertainties in the Total Solar Irradiance Climate Data Record", PI: Greg Kopp

2008-2011 **Member, SolCli Consortium**  
Solar Variability and Climate, NERC Consortium Project

## **JOURNALS REVIEWED FOR**

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Monthly Notices of the Royal Astronomical Society (MNRAS)  
Journal of Space Weather and Space Science (JSWSC)  
Journal of Geophysical Research – Space Physics (JGR-Space Physics)  
Atmospheric Chemistry and Physics Discussions (ACPD)  
Current Climate Change Reports (CCCR)  
Annales Geophysicae (ANGEO)  
Nature Geoscience (NatGeo)

## PROFESSIONAL MEMBERSHIP

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European Geosciences Union  
American Geophysical Union

## OUTREACH

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- 2013-2014     **Co-founder and co-director, ClimateSnack**  
Climate science communication project; the overall aim of ClimateSnack is to improve the writing skills of young and early career scientists around the world; Imperial College London.
- 2014           **Project leader, Science on a Sphere project**  
“*Causes of Climate Change*”; project aim was to develop talks on climate change for the public; London Science Museum.
- 2014           **Project member, Science on a Sphere project**  
“*What is a Climate Model?*”; London Science Museum
- 2014           **Co-Presenter, Pint of Science festival**  
“*The Sun and weather*” with Prof. J.D. Haigh; London
- 2014           **Talk, Institute of Physics Retired members, and Centre for Ecology & Hydrology**  
“*The Sun and Climate*”; Centre for Ecology & Hydrology, Wallingford, UK.

## POSITIONS OF RESPONSIBILITY

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- 2008-2012     **Sub-warden**, Fisher Hall, Imperial College London
- 2004-2005     **Junior Common Room Vice-President**, Executive Committee Grey College, Durham University
- 2003-2004     **Junior Common Room Secretary**, Executive Committee, Grey College, Durham University

## OTHER SKILLS TRAINING AND SUMMER SCHOOLS

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- Sept 2017     **Machine Learning**  
- Present     Masters Course, IAC/ETH Zurich
- Sept. 2017     **Leadership & Success in the Academic Community**  
Two-day training course for academic leadership roles, from PhD to Professor; organised by the Association of Academic Staff at D-USYS, ETH Zürich; run by Dr. Sarah Shepherd.
- 2014           **Stratospheric Chemistry**  
Masters Course, IAC/ETH Zürich
- 2014           **Audio skills workshop**  
Three day course to develop skills in producing and publishing audio presentations; Imperial College London, UK
- 2014           **Presentation skills course**  
Three day course to develop presentations skills in public and scientific settings; University of Bergen, Norway
- 2013           **Atmospheric Chemistry and Dynamics Summer School**  
Forschungszentrum Jülich, Germany

- 2013 **ICIC Data Analysis Workshop: Principled statistical methods for researchers**  
Three day workshop to develop skills in Bayesian statistics and numerical techniques;  
Imperial College London, UK
- 2008 **STFC Introduction to Solar and Solar-Terrestrial Physics**  
University of Sheffield, UK

#### CONFERENCES, WORKSHOPS & INVITED SEMINARS

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- 2017 **Invited talk:** *SPARC 25<sup>th</sup> anniversary, ETH Zurich, Switzerland;*  
Title: 'Evidence for continued ozone layer depletion'.
- 2017 **Invited talk:** *Seminar, LATMOS & University Pierre & Marie Curie, Paris, France;*  
Title: 'Evidence for continued ozone layer depletion'.
- 2017 **Invited talk:** *SPARC SOLARIS-HEPPA meeting, University Pierre & Marie Curie, Paris, France;* Title: 'The MASSI initiative: Methodological Analysis for Solar Signal Identification' (with WG4 co-chair R. Thieblemont).
- 2017 **Talk:** *C2SM GCM User Workshop, ETH Zurich, Switzerland;*  
Title: Quantifying solar forcing using atmospheric observations and models'
- 2017 **Invited talk:** *Solar Total and Spectral Irradiance Observations meeting, PMOD WRC, Davos, Switzerland;* Title: 'Reconciling differences in stratospheric ozone composites'
- 2017 **Invited seminar:** *IAC ETH Zurich, Zurich, Switzerland*  
Title: 'Solar variability and influences on climate'
- 2017 **Talk:** *SPARC/LOTUS Workshop, LATMOS / Université Pierre et Marie Curie, Paris, France*  
Title: 'Reconciling differences in stratospheric ozone composites'
- 2016 **Awarded talk:** *Graubünden forscht - Young Scientists Contest, Davos, Switzerland*  
Title: 'High solar cycle spectral variations inconsistent with stratospheric ozone observations'
- 2016 **Poster:** *Quadrennial Ozone Symposium 2016, Edinburgh, UK;* first author: W.T. Ball;  
presented by L. Revell  
Title: 'A new dynamical index representing short-term equatorial ozone and temperature variability'
- 2016 **Talk and poster:** *6<sup>th</sup> International Workshop SOLARIS-HEPPA, Helsinki, Finland*  
Title (talk): 'High solar cycle spectral variations inconsistent with stratospheric ozone observations'  
Title (poster): 'Constraining solar irradiance changes using ozone: uncertainties and limitations'
- 2015 **Invited and contributed talks:** *Sun-Climate Symposium, Savannah, USA*  
Title (invited): 'New Results on the Stratospheric Ozone Response to Spectral Solar Irradiance Variability'  
Title (contributed): 'PREMOS TSI: comparison to other instruments and climate implications'
- 2015 **Two talks:** *SOLARIS-HEPPA Meeting, Boulder, USA*  
Title: 'Investigating the validity of SORCE-like UV variations using ozone observations'  
Title: 'Comparison of SSI models: NRLSSI-1, NRLSSI-2 and SATIRE-S'
- 2015 **Talk and poster:** *European Geosciences Union 2015, Vienna*  
Title (talk): 'Can we use the ozone response in a CCM to say which spectral solar irradiance is most likely correct?'  
Title (poster): 'Evaluation of solar irradiance models for climate studies'
- 2014 **Invited seminar:** *GEOMAR, Kiel, Germany*  
Title: 'Spectral solar irradiance and limits on understanding the effect on stratospheric ozone'
- 2014 **Invited seminar:** *University of Cambridge, UK*  
Title: 'The SATIRE-S spectral solar irradiance and the limits in understanding the effect of irradiance on stratospheric ozone'
- 2014 **Invited seminar:** *PMOD/WRC, Davos, Switzerland*  
Title: 'Our current understanding of solar irradiance and its effect on stratospheric ozone'
- 2014 **Talk and PICO-poster session:** *European Geosciences Union 2014, Vienna*  
Title (talk): 'The SATIRE-S model and why getting solar cycle spectral irradiance trends correct is so important'

- Title (PICO-poster): *'The inference of Spectral Solar Irradiance from equatorial stratospheric ozone and current limitations of our knowledge'*
- 2014 **Talk:** *SORCE Science Meeting 2014 (conference), Cocoa Beach, Florida, USA*  
Title: *'SSI and Stratospheric Ozone: A new assessment of the relationship using Bayesian Inference'*
- 2014 **Invited seminar:** *Université de Montréal, Montréal, Canada*  
Title: *'Solar irradiance and Stratospheric ozone'*
- 2013 **Talk and poster:** *Space Climate 5 (conference), Oulu, Finland*  
Title (talk): *'SSI comparison of SATIRE-S with NRLSSI and SORCE/SOLSTICE'*  
Title (poster): *'Can stratospheric ozone observations tell us anything about solar spectral irradiance?'*
- 2013 **Invited talk, workshop:** *An Assessment of the Accuracies and Uncertainties in Total Solar Irradiance Climate Data Record, ISSI, Bern, Switzerland*  
Title: *'Reconstruction of TSI, 1974 – 2009: An update'*
- 2012 **Talk:** *2012 SORCE Science Meeting (conference), Annapolis, USA*  
Title: *'A comparison of the effect of model and observational solar spectra on changes in stratospheric ozone concentration between 2002 and 2008'*
- 2012 **Invited talk, workshop:** *An Assessment of the Accuracies and Uncertainties in Total Solar Irradiance Climate Data Record, ISSI, Bern, Switzerland*  
Title: *'Reconstruction of TSI, 1974 – 2009'*
- 2011 **Poster, workshop:** *ISSI meeting, Observing and modelling Earth's energy flows, Bern, Switzerland*  
Title: *'Reconstruction of TSI for Cycle 23 using the SATIRE-S model'*
- 2010 **Talk, workshop:** *SOLCLI Consortium Meeting 2010, Imperial College, London, UK*  
Title: *'Solar Spectral Data and Indices'*
- 2010 **Talk, COSPAR 2010 (conference), Bremen, Germany**  
Title: *'Total and spectral irradiance comparisons between SIM and SATIRE during the declining phase of cycle 23'*.
- 2010 **Talk:** *SORCE Science Meeting (conference), 2010, Keystone, Colorado, USA*  
Title: *'Understanding solar spectral variability: A six-year comparison between SIM observations and the SATIRE model'*.
- 2009 **Talk, workshop:** *ISSI Third Team Meeting on SSI modelling, Bern, Switzerland*  
Title: *'Current status in modelling with SATIRE and spectral comparisons with SIM'*
- 2009 **Talk, workshop:** *SOLCLI Consortium Meeting 2009, University of Leeds, UK*  
Title: *'First Comparisons of SIM and SATIRE Spectral Irradiance Trends'*
- 2009 **Poster:** *MOCA-09 (conference), IAMAS Meeting, Montreal, Canada*  
Title: *'Investigating Solar Irradiance Variability using the Spectral Irradiance Monitor'*
- 2009 **Poster:** *Joint European and National Astronomy Meeting 2009, Hatfield, UK*  
Title: *'Observing Solar Flux Changes using SORCE'*.

## POTENTIAL REFEREES

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**Professor Dr. Thomas Peter**, Head of the Department of Environmental Systems Science, ETH Zürich, Universitätstrasse 16, 8092 Zürich, Switzerland; Thomas.Peter@env.ethz.ch; +41 44 633 27 56.

**Dr. Eugene Rozanov**, Head of Climate Modelling Group, PMOD/WRC, Dorfstrasse 33, 7260 Davos Dorf, Davos, Switzerland; Eugene.Rozanov@pmodwrc.ch; +41 58 467 5135

**Dr. Daniel Mortlock**, Lecturer in Astro-statistics, Department of Physics, Imperial College London, Blackett Laboratory, South Kensington Campus, SW7 2AZ; d.mortlock@imperial.ac.uk; +44 20 7594 7878

**Professor Dr. Sami K. Solanki**, Max Planck Institute for Solar System Research, Justus-von-Liebig-Weg 3, 37077 Göttingen, Germany; Solanki@mps.mpg.de; +49 551 384 979-552.