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# Dr. Stefano Orani

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PLACE AND DATE OF BIRTH: Belgium, 13<sup>th</sup> of August 1986  
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**Relevant expertise:** Mathematical modelling, statistical analysis (mathematica, matlab, R, Python), programming languages (fortran, C++), problem-solving.

**Relevant experience:** Worked with international teams of researchers, led research projects, solved difficult problems, author of 9 articles published in peer-reviewed scientific journals, experienced public speaker (presentations, seminars), ability to clearly explain difficult concepts.

## Work Experience

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| SINCE 09/2017         | <b>Consultant/Data Scientist</b> , Altran/ISY, Brussels, Belgium<br>Client: TOYOTA MOTOR EUROPE<br>Statistical analysis (descriptive statistics and machine learning) of data from connected cars, using R (package development) and Python.<br>Creation of a relational database (PostgreSQL).  |
| 04/2013<br>TO 07/2017 | <b>PostDoc/Assistant</b> , University of Basel, Switzerland<br>Research in theoretical physics/cosmology<br>Mathematical modelling of the early universe.<br>Developed numerical codes to solve partial differential equations.<br>Developed statistical analysis tools to extract predictions.<br>Published research in peer-reviewed academic journals.<br>Created and taught a Masters' course on <i>Early Universe Physics</i> .<br>Supervised Masters' students during compulsory research project.<br>Contributed to training and supervision of two PhD students. |

## Education

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| 10/2009<br>TO 07/2013 | <b>PhD in Theoretical Physics</b> , Imperial College London, UK<br>Thesis: <i>Cosmological Perturbations from Hybrid Potentials</i><br>PhD advisor: Prof. Arttu RAJANTIE<br>Mathematical modelling of the early universe.<br>Published research in peer-reviewed academic journals. |
| 09/2009               | <b>MSc in Theoretical Physics</b> , Imperial College London, UK   |
| 07/2008               | <b>BSc in Physics</b> , Université Libre de Bruxelles, Belgium  |
| FALL 2007             | Exchange Semester at Université de Montréal, Canada   |
| 07/2004               | European School of Brussels II, Brussels, Belgium   |

## Languages

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| ENGLISH: fluent | ITALIAN: native | GERMAN: basic           |
| FRENCH: fluent  | GREEK: fluent   | SPANISH: conversational |

## List of publications

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Link to publications on [inSPIRE](#)

- [1] S. Antusch, F. Cefala, S. Krippendorff, F. Muia, S. Orani and F. Quevedo,  
*Oscillons from String Moduli*, [arXiv:1708.08922](#) [hep-th].
- [2] S. Antusch, F. Cefala and S. Orani,  
*Gravitational waves from oscillons after inflation*,  
**Phys.Rev.Lett.** **118** (2017) no.1, 011303, [arXiv:1607.01314](#) [astro-ph.CO].
- [3] S. Antusch and S. Orani,  
*Impact of other scalar fields on oscillons after hilltop inflation*,  
**JCAP** **1603** (2016) 03, 044, [arXiv:1511.02336](#) [hep-ph].
- [4] S. Antusch, F. Cefala, D. Nolde and S. Orani,  
*Parametric resonance after hilltop inflation caused by an inhomogeneous inflaton field*,  
**JCAP** **1602** (2016) 02, 026, [arXiv:1510.04856](#) [hep-ph].
- [5] S. Antusch, D. Nolde and S. Orani,  
*Hill crossing during preheating after hilltop inflation*,  
**JCAP** **1506** (2015) 06, 009, [arXiv:1503.06075](#) [hep-ph].
- [6] S. Antusch, F. Cefala, D. Nolde and S. Orani,  
*False vacuum energy dominated inflation with large  $r$  and the importance of  $\kappa_s$* ,  
**JCAP** **1410** (2014) 10, 015, [arXiv:1406.1424](#) [hep-ph].
- [7] S. Antusch, D. Nolde and S. Orani,  
*Hilltop inflation with preinflation from coupling to matter fields*,  
**JCAP** **1405** (2014) 034, [arXiv:1402.5328](#) [hep-ph].
- [8] J. Elliston, S. Orani and D. J. Mulryne,  
*General analytic predictions of two-field inflation and perturbative reheating*,  
**Phys.Rev.** **D89** (2014) 10, 103532, [arXiv:1402.4800](#) [astro-ph.CO].
- [9] S. Orani,  
*Cosmological Perturbations from Hybrid Potentials*,  
**PhD thesis**, [arXiv:1308.5525](#) [astro-ph.CO].
- [10] S. Orani and A. Rajantie,  
*Supersymmetric hybrid inflation with a light scalar*,  
**Phys.Rev.** **D88** (2013) 043508, [arXiv:1304.8041](#) [astro-ph.CO].
- [11] D. Mulryne, S. Orani and A. Rajantie,  
*Non-Gaussianity from the hybrid potential*,  
**Phys.Rev.** **D84** (2011) 123527, [arXiv:1107.4739](#) [hep-th].

## Conference contributions and seminars

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| 1  | SWISS COSMOLOGY DAYS 2017<br>UNIVERSITY OF BASEL, 06-07/02/2017       | <b>Organizer</b><br>presentation based on [2]  |
| 2  | PROBING THE EARLY UNIVERSE WITH GRAVITY<br>APC, PARIS, 23-25/11/2016  | presentation based on [2]                      |
| 3  | QUEEN MARY UNIVERSITY OF LONDON<br>LONDON, 09/11/2016                 | invited seminar based on [2]                   |
| 4  | LISA COSMOLOGY WG MEETING 2016<br>DESY, HAMBURG, 17-21/10/2016        | presentation based on [2]                      |
| 5  | UNIVERSITÉ CATHOLIQUE DE LOUVAIN<br>LOUVAIN-LA-NEUVE, 18/05/2016      | invited seminar based on [3]                   |
| 6  | RWTH<br>AACHEN, 22/01/2016  | invited seminar based on [3]                   |
| 7  | 28 <sup>th</sup> TEXAS SYMPOSIUM 2015<br>GENEVA, 14-18/12/2015        | presentation based on [3]                      |
| 8  | COSPA<br>MONS, 20/05/2015   | presentation based on [5]                      |
| 9  | SWISS COSMOLOGY DAYS 2015<br>GENEVA, 06-07/02/2015                    | presentation based on [5]                      |
| 10 | PARTICLE COSMOLOGY AFTER PLANCK<br>DESY, HAMBURG, 23-26/09/2014       | presentation based on [6]                      |
| 11 | IMPERIAL COLLEGE LONDON<br>LONDON, 09/05/2014                         | invited seminar based on [7]                   |
| 12 | UNIVERSITÉ DE NAMUR<br>NAMUR, 17/01/2014                              | invited seminar based on [7]                   |
| 13 | PASCOS 2013<br>TAIPEI, 20-26/11/2013                                  | presentation based on [10]                     |
| 14 | QUEEN MARY UNIVERSITY OF LONDON<br>LONDON, 16/01/2013                 | invited seminar based on [10] and [11]         |
| 15 | UNIVERSITY OF BASEL<br>BASEL, 16/10/2012                              | invited seminar based on [10] and [11]         |
| 16 | WORKSHOP ON NON-EQUILIBRIUM FT<br>IN COSMOLOGY, LONDON, 20-21/09/2012 | <b>Organizer</b><br>presentation based on [11] |
| 17 | LCDM, KCL<br>LONDON, 24/05/2012                                       | presentation based on [11]                     |
| 18 | HELSINKI INSTITUTE OF PHYSICS<br>HELSINKI, 24/01/2012                 | invited seminar based on [11]                  |
| 19 | UKCOSMO, ICG<br>PORTSMOUTH, 14/09/2011                                | presentation based on [11]                     |
| 20 | COSMO 2011<br>PORTO, 22-26/08/2011                                    | poster based on [11]                           |