

CURRICULUM VITAE

Arttu Kalervo Rajantie

1. Basic Information

Employment:

2013 – Professor of Theoretical Physics, Imperial College London
2008 – 2013 Reader in Theoretical Physics, Imperial College London
2005 – 2008 Lecturer in Theoretical Physics, Imperial College London
2002 – 2005 Junior Research Fellow, Churchill College, University of Cambridge
2000 – 2003 Postdoctoral Research Associate, University of Cambridge
1998 – 2000 Postdoctoral Research Associate, University of Sussex
1998 Researcher, Helsinki Institute of Physics
1995 – 1997 Research Assistant, University of Helsinki

Education:

2008 Certificate of Advanced Study in Learning and Teaching, Imperial College London, UK
1997 PhD in Theoretical Physics, University of Helsinki
1996 MSc in Theoretical Physics, University of Helsinki
1995 BSc in Theoretical Physics, University of Helsinki

Memberships of Scientific Societies:

- Fellow of Institute of Physics (UK)
- Fellow of the Royal Astronomical Society (UK)
- Fellow of Higher Education Academy (UK)
- Member of Finnish Physical Society (Finland)

2. External Roles

Expert positions:

- Member, DiRAC Data Intensive Service Management Board (from 2018)
- Member, Royal Society Research Appointments Panel A(iii) (from 2017)
- Member, Norwegian Centres of Excellence Phase 1 Selection Panel (2021)
- External Peer, Faculty of Natural and Mathematical Sciences, King's College London (2015-2019)
- Member of STFC Computing Advisory Panel (2014-2019)
- Chair, Expert Assessment Panel for Assistant Professorship, University of Stavanger, Norway (2018)
- Member, STFC Particle Theory Review Panel (2017-2018)
- External Examiner for the Physics Undergraduate and MSc Programmes, University of Sussex (2013-2017)
- External Examiner for the Physics Undergraduate and MSc Programmes, King's College London (2010-2014)
- Docent in Theoretical Physics, University of Helsinki (from 2003)
- Research student examiner for several universities in the UK and elsewhere
- Referee for several funding agencies, promotion panels, journals and book publishers
- Recognised as an "Outstanding Referee" by American Physical Society in 2012

Outreach:

- Chairman and lead organiser, [Finnish Science 100](#) Symposium, Imperial College London, 4 November 2017
- Lead exhibitor of the *Monopole Quest* exhibit at the Royal Society Summer Science Exhibition 2015
- Member of the Organising Committee, *Salam+50*, 7 July 2007, Imperial College London (One-day event of public talks celebrating Nobel Laureate Abdus Salam's legacy)
- Given public talks in several countries, talks to primary and secondary school pupils, and participated in many outreach events including *I'm a Scientist, Get me out of here!*, *Pint of Science*, *Science Uncovered*, *Worldcon 75*
- Popular science articles in *Physics Today*, *Contemporary Physics* and *Arkhimedes* (Finnish Physical Society)
- Interviewed on BBC News Channel, BBC World News, YLE (Finland), BBC local radio stations. Research covered in the *Sunday Times* and other print and online media.

Other activities:

- Chair, Finnish Science Society in the UK
- Chair of Governors, Highdown School and Sixth Form Centre, Reading

3. Teaching

Lecturing:

- 2016 – *Unification – the Standard Model*, MSc and 4th year UG, Imperial College
- 2006 – 2015 *Advanced Quantum Field Theory*, MSc, Imperial College
- 2011 – 2014 *Advanced Classical Physics*, 3rd year UG, Imperial College
- 2006 – 2010 *Statistical Physics*, 2nd year UG, Imperial College
- 2003 – 2004 *Cosmology*, Part III Mathematics (PG), University of Cambridge
- 1999 – 2000 *General Relativity*, 4th year UG, University of Sussex
- 1997 – 1998 *Analytical Mechanics*, 2nd year UG, University of Helsinki

Other teaching:

- Supervised 39 Masters dissertations
- Extensive experience of tutorials and small-group teaching

Administration:

- Admissions Tutor for Physics (from 2020)
- Member of departmental Teaching Committee (2010 – 2013, from 2020)
- Member of the departmental Juno Committee (from 2020)
- Member of the Undergraduate Admissions Panel (2017 – 2020)
- Admissions Tutor for MSc in Quantum Fields and Fundamental Forces (2007 – 2020)
- Member of departmental Academic Promotions Panel (2015 – 2017)
- Member of departmental Course Review Panel (2010 – 2013)

4. Research

The overall theme of my research is the *application of particle physics theories to cosmology*. By exploiting theoretical connections between particle physics and cosmology, and new data from experiments such as the Large Hadron Collider at CERN and cosmological observations, we can learn about fundamental physics at energies far beyond the reach of particle accelerators and understand the beginning of the Universe better. This requires development of new, more sophisticated theoretical methods and use of high-performance computing.

The main focus of my research is on understanding the dynamics of the Higgs field in the early Universe. The Higgs field, discovered in 2012 at the LHC, is unlike any other elementary particle, and its special properties make it particularly important for cosmology. Higgs particles were produced in large numbers in the early Universe, with potentially observable consequences. It is believed that the Higgs field played a central role in the origin of ordinary, visible matter, and it may also hold the key to understanding the nature of dark matter.

I am also involved in the MoEDAL experiment at the LHC, which started operation in 2015 and is looking for magnetic monopoles and other exotic particles which may have been produced in particle collisions. In addition, I am interested in similar non-equilibrium processes in other quantum systems which provide a way to do “cosmology in the laboratory” and may also have direct practical applications.

Activities:

- [Institute for Particle Physics Phenomenology](#) Associateship (2019 – 21)
- Chair of Speakers' Committee, [MoEDAL collaboration](#), LHC, CERN
- Associate Member, [LISA Collaboration](#) (Laser Interferometer Space Antenna)
- Board Member, UK Lattice Field Theory Virtual Centre
- Chair, Royal Society Theo Murphy Scientific Discussion Meeting [“Higgs Cosmology”](#), 27-28 March 2017
- Chair, *PASCOS-07* (13th International Symposium on Particles, Strings and Cosmology), July 2007, Imperial College London
- Involved in organisation of several international conferences
- 33 invited talks at international conferences, 69 invited research seminars
- 89 articles published in refereed scientific journals

Research Students:

- Currently supervising four PhD students
- Supervised 8 completed PhD theses:
 - Manuel Donaire (finished in 2007)
 - Alex Chambers (finished in 2010)
 - David Weir (finished in 2011)
 - Stefano Orani (finished in 2013)
 - Laura Bethke (finished in 2014)
 - Oliver Gould (finished in 2017)
 - Edward Gillman (finished in 2018)
 - Stephen Stopyra (finished in 2018)

Funding:

- Co-I on STFC Rolling/Consolidated grants supporting research in the Theoretical Physics Group at Imperial College (from 2005)
- PI on a Royal Society International Joint Project “*Non-equilibrium quantum field theory in cosmology*” with Helsinki Institute of Physics, Finland (2010 – 2012)
- Co-I on PPARC grant supporting the COSMOS supercomputer (2006 – 2009)
- Recognised Researcher on a PPARC Special Programme Grant “*Classical Field Theory*” (2003 – 2007)

Publications:

In theoretical physics the authors are conventionally listed in alphabetical order.

Refereed papers

1. A.K. Rajantie, “*Feynman diagrams to three loops in three-dimensional field theory*”, [Nuclear Physics B480 \(1996\) 729–752 \[hep-ph/9606216\]](#); Erratum: [Nuclear Physics B513 \(1998\) 761–762](#).
2. A. Rajantie, “*SU(5)+adjoint Higgs model at finite temperature*”, [Nuclear Physics B501 \(1997\) 521–544 \[hep-ph/9702255\]](#).
3. K. Kajantie, M. Laine, J. Peisa, A. Rajantie, K. Rummukainen and M. Shaposhnikov, “*Nonperturbative Debye mass in finite-T QCD*”, [Physical Review Letters 79 \(1997\) 3130–3133 \[hep-ph/9708207\]](#).
4. M. Laine and A. Rajantie, “*Lattice-continuum relations for 3d SU(N)+Higgs theories*”, [Nuclear Physics B513 \(1998\) 471–489 \[hep-lat/9705003\]](#).
5. A. Rajantie, “*Vortices and the Ginzburg-Landau phase transition*”, [Physica B255 \(1998\) 108–115 \[cond-mat/9803221\]](#).
6. K. Kajantie, M. Karjalainen, M. Laine, J. Peisa and A. Rajantie, “*Thermodynamics of gauge-invariant U(1) vortices from lattice Monte Carlo simulations*”, [Physics Letters B428 \(1998\) 334–341 \[hep-ph/9803367\]](#).
7. K. Kajantie, M. Laine, A. Rajantie, K. Rummukainen and M. Tsy-pin, “*The phase diagram of three-dimensional SU(3)+adjoint Higgs theory*”, [Journal of High Energy Physics 9811 \(1998\) 011 \[hep-lat/9811004\]](#).
8. K. Kajantie, M. Laine, T. Neuhaus, J. Peisa, A. Rajantie and K. Rummukainen, “*Vortex tension as an order parameter in three-dimensional U(1)+Higgs theory*”, [Nuclear Physics B546 \(1999\) 351–365 \[hep-ph/9809334\]](#).
9. A. Rajantie and M. Hindmarsh, “*Simulating hot Abelian gauge dynamics*”, [Physical Review D60 \(1999\) 096001 \[hep-ph/9904270\]](#).
10. K. Kajantie, M. Laine, T. Neuhaus, A. Rajantie and K. Rummukainen, “*Statistical mechanics of vortices from field theory*”, [Nuclear Physics B559 \(1999\) 395–428 \[hep-lat/9906028\]](#).
11. A. Rajantie and E.J. Copeland, “*Phase transitions from preheating in gauge theories*”, [Physical Review Letters 85 \(2000\) 916–919 \[hep-ph/0003025\]](#).
13. K. Kajantie, M. Laine, T. Neuhaus, A. Rajantie and K. Rummukainen, “*O(2) symmetry breaking vs. vortex loop percolation*”, [Physics Letters B482 \(2000\) 114–122 \[hep-lat/0003020\]](#).
14. M. Hindmarsh and A. Rajantie, “*Defect formation and local gauge invariance*”, [Physical Review Letters 85 \(2000\) 4660–4663 \[cond-mat/0007361\]](#).
16. A.C. Davis, T.W.B. Kibble, A. Rajantie and H. Shanahan, “*Topological defects in lattice gauge theories*”, [Journal of High Energy Physics 0011 \(2000\) 010 \[hep-lat/0009037\]](#).
17. A. Rajantie, P.M. Saffin and E.J. Copeland, “*Electroweak preheating on a lattice*”, [Physical Review D63 \(2001\) 123512 \[hep-ph/0012097\]](#).
18. A. Rajantie, “*Local gauge invariance and formation of topological defects*”, [Journal of Low Temperature Physics 124 \(2001\) 5–16 \[cond-mat/0102403\]](#).
19. E.J. Copeland, D. Lyth, A. Rajantie and M. Trodden, “*Hybrid inflation and baryogenesis at the TeV scale*”, [Physical Review D64 \(2001\) 043506 \[hep-ph/0103231\]](#).
20. M. Hindmarsh and A. Rajantie, “*Phase transition dynamics in the hot Abelian Higgs model*”, [Physical Review D64 \(2001\) 065016 \[hep-ph/0103311\]](#).

21. A. Rajantie, "Formation of topological defects in gauge field theories" (invited review), [International Journal of Modern Physics A17 \(2002\) 1–44](#) [[hep-ph/0108159](#)].
22. A.C. Davis, A. Hart, T.W.B. Kibble and A. Rajantie, "The monopole mass in the three-dimensional Georgi–Glashow model", [Physical Review D65 \(2002\) 125008](#) [[hep-lat/0110154](#)].
23. E.J. Copeland, S. Pascoli and A. Rajantie, "Dynamics of tachyonic preheating after hybrid inflation", [Physical Review D65 \(2002\) 103517](#) [[hep-ph/0202031](#)].
24. T. Neuhaus, A. Rajantie and K. Rummukainen, "Numerical study of duality and universality in a frozen superconductor", [Physical Review B67 \(2003\) 104525](#) [[cond-mat/0205523](#)].
25. A. Rajantie, "Magnetic monopoles from gauge theory phase transitions", [Physical Review D68 \(2003\) 021301](#) [[hep-ph/0212130](#)].
26. T.W.B. Kibble and A. Rajantie, "Estimation of vortex density after superconducting film quench", [Physical Review B68 \(2003\) 174512](#) [[cond-mat/0306633](#)].
27. A. Rajantie, "Defect formation in the early universe", [Contemporary Physics 44 \(2003\) 485–502](#) [[astro-ph/0307387](#)].
28. K. Rajantie, M. Laine, T. Neuhaus, A. Rajantie and K. Rummukainen, "Duality and scaling in three-dimensional scalar electrodynamics", [Nuclear Physics B699 \(2004\) 632–656](#) [[hep-lat/0402021](#)].
29. E.J. Copeland and A. Rajantie, "The end of locked inflation", [Journal of Cosmology and Astroparticle Physics 0502 \(2005\) 008](#) [[astro-ph/0501668](#)].
30. A. Rajantie, "Kosmisia jäniteitä suprajohteissa", [Arkhimedes 3 \(2005\) 9–13](#) (in Finnish).
31. M. Donaire and A. Rajantie, "Heavy cosmic strings", [Physical Review D73 \(2006\) 063517](#) [[hep-ph/0508272](#)].
32. A. Rajantie, "Mass of a quantum 't Hooft-Polyakov monopole", [Journal of High Energy Physics 0601 \(2006\) 088](#) [[hep-lat/0512006](#)].
33. A. Rajantie and A. Tranberg, "Looking for defects in the 2PI correlator", [Journal of High Energy Physics 0611 \(2006\) 020](#) [[hep-ph/0607292](#)].
34. M. Donaire, T.W.B. Kibble and A. Rajantie, "Spontaneous vortex formation on a superconductor film", [New Journal of Physics 9 \(2007\) 148](#) [[cond-mat/0409172](#)].
35. A. Rajantie, M. Sakellariadou and H. Stoica, "Numerical experiments with p F- and q D-strings: The formation of (p,q) bound states", [Journal of Cosmology and Astroparticle Physics 0711 \(2007\) 021](#) [[arXiv:0706.3662](#)].
36. A. Chambers and A. Rajantie, "Lattice calculation of non-Gaussianity from preheating", [Physical Review Letters 100 \(2008\) 041302](#) [[arXiv:0710.4133](#)]; Erratum: [Physical Review Letters 101 \(2008\) 149903](#).
37. A. Chambers and A. Rajantie, "Non-Gaussianity from massless preheating", [Journal of Cosmology and Astroparticle Physics 0808 \(2008\) 002](#) [[arXiv:0805.4795](#)].
38. A. Rajantie, "Superhorizon cosmic strings correlations", [Physical Review D79 \(2009\) 043515](#) [[arXiv:0810.3007](#)].
39. A. Rajantie and D.J. Weir, "Quantum kink and its excitations", [Journal of High Energy Physics 0904 \(2009\) 068](#) [[arXiv:0902.0367](#)].
40. S. Edwards, D. Mehta, A. Rajantie and L. von Smekal, "'t Hooft-Polyakov monopoles in lattice $SU(N)$ -adjoint Higgs theory", [Physical Review D80 \(2009\) 065030](#) [[arXiv:0906.5531](#)].
41. A. Chambers, S. Nurmi and A. Rajantie, "Non-Gaussianity from resonant curvaton decay", [Journal of Cosmology and Astroparticle Physics 1001 \(2010\) 012](#) [[arXiv:0909.4535](#)].
42. A. Rajantie and A. Tranberg, "Counting defects with the two-point correlator", [Journal of High Energy Physics 1008 \(2010\) 086](#) [[arXiv:1005.0269](#)].
43. A. Rajantie and D. Weir, "Soliton form factors from lattice simulations", [Physical Review D82 \(2010\) 111502](#) [[arXiv:1006.2410](#)].
44. D. Mulryne, S. Orani and A. Rajantie, "Non-Gaussianity from the hybrid potential", [Physical Review D84 \(2011\) 123527](#) [[arXiv:1107.4739](#)].
45. D.G. Figueroa, J. Garcia-Bellido and A. Rajantie, "On the transverse-traceless projection in lattice simulations of gravitational wave production", [Journal of Cosmology and Astroparticle Physics 1111 \(2011\) 015](#) [[arXiv:1110.0337](#)].
46. A. Rajantie and D. Weir, "Nonperturbative study of the 't Hooft-Polyakov monopole form factors", [Physical Review D85 \(2012\) 025003](#) [[arXiv:1109.0299](#)].

48. A. Rajantie, "Introduction to Magnetic Monopoles", [Contemporary Physics 53 \(2012\) 195 \[arXiv:1204.3077\]](#).
49. A. Rajantie, "Magnetic Monopoles in Field Theory and Cosmology", [Philosophical Transactions of the Royal Society A370 \(2012\) 5705 \[arXiv:1204.3073\]](#).
50. M. D'Onofrio, R.N. Lerner and A. Rajantie, "Electrically charged curvaton", [Journal of Cosmology and Astroparticle Physics 10 \(2012\) 004 \[arXiv:1207.1063\]](#).
51. A. Rajantie, K. Rummukainen and D.J. Weir, "Form factor and width of a quantum string", [Physical Review D86 \(2013\) 125040 \[arXiv:1210.1106\]](#).
52. L. Bethke, D.G. Figueroa and A. Rajantie, "Anisotropies in the gravitational wave background from preheating", [Physical Review Letters 111 \(2013\) 011301 \[arXiv:1304.2657\]](#).
53. S. Orani and A. Rajantie, "Supersymmetric hybrid inflation with a light scalar", [Physical Review D88 \(2013\) 043508 \[arXiv:1304.8041\]](#).
54. L. Bethke, D.G. Figueroa and A. Rajantie, "On the Anisotropy of the Gravitational Wave Background from Massless Preheating", [Journal of Cosmology and Astroparticle Physics 06 \(2014\) 047 \[arXiv:1309.1148\]](#).
55. MoEDAL Collaboration, "The Physics Programme Of The MoEDAL Experiment At The LHC", [International Journal of Modern Physics A29 \(2014\) 1430050 \[arXiv:1405.7662\]](#).
56. M. Herranen, T. Markkanen, S. Nurmi and A. Rajantie, "Spacetime curvature and the Higgs stability during inflation", [Physical Review Letters 113 \(2014\) 211102 \[arXiv:1407.3141\]](#).
57. M. Herranen, T. Markkanen, S. Nurmi and A. Rajantie, "Spacetime curvature and the Higgs stability after inflation", [Physical Review Letters 115 \(2015\) 241301 \[arXiv:1506.04065\]](#).
58. A. Rajantie, "The search for magnetic monopoles", [Physics Today 69 \(2016\) no. 10, 40-46](#).
59. MoEDAL Collaboration, "Search for magnetic monopoles with the MoEDAL prototype trapping detector in 8 TeV proton-proton collisions at the LHC", [Journal of High Energy Physics 1608 \(2016\) 067 \[arXiv:1604.06645\]](#).
60. A. Rajantie and S. Stopyra, "Standard Model vacuum decay with gravity", [Physical Review D95 \(2017\) 025008 \[arXiv:1606.00849\]](#).
61. T. Markkanen and A. Rajantie, "Massive scalar field evolution in de Sitter", [Journal of High Energy Physics 1701 \(2017\) 133 \[arXiv:1607.00334\]](#).
62. MoEDAL Collaboration, "Search for magnetic monopoles with the MoEDAL forward trapping detector in 13 TeV proton-proton collisions at the LHC", [Physical Review Letters 118 \(2017\) 061801 \[arXiv:1611.06817\]](#).
63. O. Gould and A. Rajantie, "Thermal Schwinger pair production at arbitrary coupling", [Physical Review D96 \(2017\) 076002 \[arXiv:1704.04801\]](#).
64. O. Gould and A. Rajantie, "Magnetic monopole mass bounds from heavy ion collisions and neutron stars", [Physical Review Letters 119 \(2017\) 241601 \[arXiv:1704.04801\]](#).
65. E. Gillman and A. Rajantie, "Topological Defects in Quantum Field Theory with Matrix Product States", [Physical Review D96 \(2017\) 094509 \[arXiv:1705.09802\]](#).
66. T. Markkanen, S. Nurmi and A. Rajantie, "Do metric fluctuations affect the Higgs dynamics during inflation?", [Journal of Cosmology and Astroparticle Physics 1712 \(2017\) 026 \[arXiv:1707.00866\]](#).
67. A. Rajantie and S. Stopyra, "Standard Model vacuum decay in a de Sitter Background", [Physical Review D97 \(2018\) 025012 \[arXiv:1707.09175\]](#).
68. D.G. Figueroa, A. Rajantie and F. Torrenti, "Higgs-curvature coupling and post-inflationary vacuum instability", [Physical Review D98 \(2018\) 023532 \[arXiv:1709.00398\]](#).
69. E. Gillman and A. Rajantie, "The Kibble Zurek Mechanism of Topological Defect Formation in Quantum Field Theory with Matrix Product States", [Physical Review D97 \(2018\) 094505 \[arXiv:1711.10452\]](#).
70. MoEDAL Collaboration, "Search for magnetic monopoles with the MoEDAL forward trapping detector in 2.11 fb^{-1} of 13 TeV proton-proton collisions at the LHC", [Physics Letters B782 \(2018\) 510 \[arXiv:1712.09849\]](#).
71. S.V. Imrith, D.J. Mulryne and A. Rajantie, "Non-perturbative δN ", [Physical Review D98 \(2018\) 043513 \[arXiv:1801.02600\]](#).
72. T. Markkanen, S. Nurmi, A. Rajantie and S. Stopyra, "The 1-loop effective potential for the Standard Model in curved spacetime", [Journal of High Energy Physics 1806 \(2018\) 040 \[arXiv:1804.02020\]](#).
73. O. Gould, A. Rajantie and C. Xie, "Worldline sphaleron for thermal Schwinger pair production", [Physical Review D98 \(2018\) 056022 \[arXiv:1806.02665\]](#).

74. T. Markkanen, A. Rajantie and S. Stopyra, “Cosmological aspects of Higgs vacuum metastability”, [Frontiers in Astronomy and Space Sciences 5 \(2018\) 40](#) [arXiv:1809.06923].
75. T. Markkanen, A. Rajantie and T. Tenkanen, “Spectator Dark Matter”, [Physical Review D98 \(2018\) 123532](#) [arXiv:1811.02586].
76. O. Gould, S. Mangles, A. Rajantie, S. Rose and C. Xie, “Observing Thermal Schwinger Pair Production”, [Physical Review A99 \(2019\) 052120](#) [arXiv:1812.04089].
77. R. Bruce et al., “New physics searches with heavy-ion collisions at the LHC”, [Journal of Physics G47 \(2020\) 060501](#) [arXiv:1812.07688].
78. O. Gould, D.L.-J. Ho and A. Rajantie, “Towards Schwinger production of magnetic monopoles in heavy-ion collisions”, [Physical Review D100 \(2019\) 015041](#) [arXiv:1902.04388].
79. S.V. Imrith, D.J. Mulryne and A. Rajantie, “The primordial curvature perturbation from lattice simulations”, [Physical Review D100 \(2019\) 043543](#) [arXiv:1903.07487].
80. MoEDAL Collaboration, “Magnetic Monopole Search with the Full MoEDAL Trapping Detector in 13 TeV pp Collisions Interpreted in Photon-Fusion and Drell-Yan Production”, [Physical Review Letters 123 \(2019\) 021802](#) [arXiv:1903.08491].
81. T. Markkanen, A. Rajantie, S. Stopyra and T. Tenkanen, “Scalar correlation functions in de Sitter space from the stochastic spectral expansion”, [Journal of Cosmology and Astroparticle Physics 08 \(2019\) 001](#) [arXiv:1904.11917].
82. A. Rajantie, “Monopole-antimonopole pair production by magnetic fields”, [Philosophical Transactions of the Royal Society A377 \(2019\) 20190333](#) [arXiv:1907.05745].
83. D.L.-J. Ho and A. Rajantie, “Classical production of 't Hooft-Polyakov monopoles from magnetic fields”, [Physical Review D101 \(2020\) 055003](#) [arXiv:1911.06088].
84. T. Markkanen and A. Rajantie, “Scalar correlation functions for a double-well potential in de Sitter space”, [Journal of Cosmology and Astroparticle Physics 03 \(2020\) 049](#) [arXiv:2001.04494].
85. LISA Collaboration, “Prospects for Fundamental Physics with LISA”, [General Relativity and Gravitation 52 \(2020\) 81](#) [arXiv:2001.09793].
86. D.L.-J. Ho and A. Rajantie, “Electroweak sphaleron in a strong magnetic field”, [Physical Review D102 \(2020\) 053002](#) [arXiv:2005.03125].
87. A. Karam et al., “Novel mechanism for primordial perturbations in minimal extensions of the Standard Model”, [Journal of High Energy Physics 11 \(2020\) 153](#) [arXiv:2006.14404].
88. MoEDAL Collaboration, “First search for dyons with the full MoEDAL trapping detector in 13 TeV pp collisions”, [Physical Review Letters 126 \(2021\) 071801](#) [arXiv:2002.00861].
89. A. Mantziris, T. Markkanen and A. Rajantie, “Vacuum decay constraints on the Higgs curvature coupling from inflation”, [Journal of Cosmology and Astroparticle Physics 03 \(2021\) 077](#) [arXiv:2011.03763].
90. A. Cable and A. Rajantie, “Free scalar correlators in de Sitter via the stochastic approach beyond slow roll”, [arXiv:2011.00907](#).
91. A. Karam et al., “Higgs-like spectator field as the origin of structure”, [arXiv:2103.02569](#).
92. D.L.-J. Ho and A. Rajantie, “Instanton solution for Schwinger production of 't Hooft-Polyakov monopoles”, [arXiv:2103.12799](#).
93. O. Gould, D.L.-J. Ho and A. Rajantie, “Schwinger pair production of magnetic monopoles: momentum distribution for heavy-ion collisions”, [arXiv:2103.14454](#).

Journal Issues Edited

94. A. Eichhorn, M. Fairbairn, T. Markkanen and A. Rajantie (Ed.), “Theo Murphy meeting issue ‘Higgs Cosmology’”, [Philosophical Transactions of the Royal Society A376 \(2018\) issue 2114](#).

Books Authored

95. A. Rajantie, “Effective field theory methods for finite temperature grand unified theories”, PhD thesis, University of Helsinki, Report Series in Physics, HU-P-D65, (Helsinki University Press, Helsinki, 1997) ISBN 951-45-7854-6.

Books Edited

96. A. Rajantie, P. Dauncey, C. Contaldi and H. Stoica (Ed.), *“Particles, Strings, and Cosmology (PASCOS 2007)”*, Proceedings of the 13th International Symposium on Particles, Strings and Cosmology, in press (American Institute of Physics, 2007) ISBN 978-0-7354-0471-7.

Contributions to Books Edited by Others

97. A. Rajantie, “Kosminen inflaatio ja pimeä energia”, in “Suhteellista? Einsteinin suhteellisuusteorian jalanjäljillä”, ed. Jan Rydman, (Helsinki University Press, Helsinki, 2005), pp. 116–125.

Non-Refereed Publications

98. K. Kajantie, M. Laine, J. Peisa, A. Rajantie, K. Rummukainen, M.E. Shaposhnikov, *“High-T QCD and dimensional reduction: Measuring the Debye mass”*, Lattice 97, Edinburgh, Scotland, 22-26 Jul 1997, Nuclear Physics Proceedings Supplement **63** (1998) 418-420 [hep-lat/9709024].
99. A. Rajantie, *“SU(5) + adjoint Higgs at finite temperature”*, Strong and Electroweak Matter 1997, Eger, Hungary, 21-25 May 1997 (World Scientific, Singapore, 1998) [hep-ph/9709368].
100. A. Rajantie, K. Kajantie, M. Laine, M. Karjalainen and J. Peisa, *“Vortices in equilibrium scalar electrodynamics”*, Particles, Strings and Cosmology (PASCOS 98), Boston, MA, 22-27 Mar 1998 (World Scientific, Singapore, 1999) [hep-lat/9807042].
101. J. Peisa, K. Kajantie, M. Laine, T. Neuhaus, A. Rajantie and K. Rummukainen, *“Gauge invariant strings in the 3D U(1) + Higgs theory”*, Lattice 98, Boulder, Colorado, 13-18 Jul 1998, Nuclear Physics Proceedings Supplement **73** (1999) 703–705 [hep-lat/9809047].
102. A. Rajantie, *“Vortex tension and the phases of 3D U(1) + Higgs”*, Strong and Electroweak Matter 1998, Copenhagen, Denmark, 2-5 Dec 1998. (World Scientific, Singapore, 1999).
103. A. Rajantie, *“Abelian hard thermal loops on a lattice”*, Lattice 99, Pisa, Italy, 29 Jun-3 Jul 1999. Nuclear Physics Proceedings Supplement **83** (2000) 580–582 [hep-lat/9909021].
104. A. Rajantie, *“Non-equilibrium dynamics of hot Abelian Higgs model”*, Cosmo-99, Trieste, Italy 27 Sep-3 Oct 1999 (World Scientific, Singapore, 2000) [hep-ph/0001294].
105. A. Rajantie, P.M. Saffin and E.J. Copeland, *“Numerical simulations of electroweak baryogenesis at preheating”*, Cosmo 2000, Cheju Island, Korea, 4-8 Sep 2000. (World Scientific, Singapore, 2001) [hep-ph/0010347].
106. A. Rajantie, *“Preheating and phase transitions in gauge theories”*, Strong and Electroweak Matter 2000, Marseille, France, 14-17 Jun 2000. (World Scientific, Singapore, 2001) [hep-ph/0010224].
107. Arttu Rajantie, *“Baryogenesis at the end of hybrid inflation”*, Cosmo-01, Rovaniemi, Finland, 30 Aug-4 Sep 2001 [hep-ph/0111200].
108. K. Kajantie, M. Laine, T. Neuhaus, A. Rajantie and K. Rummukainen, *“Critical behavior of the Ginzburg-Landau model in the type II region”*, Lattice 2001, Berlin, Germany, 19-24 Aug 2001. Nuclear Physics Proceedings Supplement **106** (2002) 959–961 [hep-lat/0110062].
109. T. Neuhaus, A. Rajantie and K. Rummukainen, *“The Inverted XY universality of the superconductivity phase transition”*, Lattice 2002, Cambridge, Massachusetts, 24-29 Jun 2002. Nuclear Physics Proceedings Supplement **119** (2003) 915–917 [hep-lat/0209103].
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