

# Ville Vaskonen

Curriculum Vitæ  
August 9, 2018

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Born October 18th 1989 in Joensuu, Finland. Finnish citizen.

## Present position

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**Postdoctoral researcher**, NICPB, Tallinn, Estonia, **Sep, 2016 - Aug, 2018**  
Laboratory of High Energy and Computational Physics.

## Past positions

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**Doctoral candidate**, University of Jyväskylä, Finland, **Sep, 2013 - Aug, 2016**  
Theoretical Particle Physics and Cosmology group.

**Trainee**, University of Jyväskylä, Finland, **Jun - Aug, 2013**  
Theoretical Particle Physics and Cosmology group.

**Trainee**, University of Jyväskylä, Finland, **Jun - Jul, 2012**  
Theoretical Particle Physics and Cosmology group.

## Education

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**Doctor of Philosophy**, University of Jyväskylä, Finland **Oct, 2016**  
Scientific postgraduate studies in theoretical physics (grade 5/5, excellent). PhD Thesis “Dark Matter and Baryogenesis in Higgs Portal Models”, opponent Prof James M. Cline, supervisors Prof Kimmo Kainulainen and Dr Kimmo Tuominen. Funded by personal grants from Finnish Cultural Foundation (2014) and Magnus Ehrnrooth Foundation (2015-2016).

**Master of Science**, University of Jyväskylä, Finland **Aug, 2013**  
Advanced studies in theoretical physics (5/5) and advanced studies in mathematics (5/5). Master’s Thesis: “Extensions of the Standard Model Scalar Sector and Constraints From Colliders and Cosmology”, supervisor Dr Kimmo Tuominen. Master’s Thesis (mathematics as a secondary subject): “Representation Theory of Compact Groups”, supervisor Prof Jouni Parkkonen.

**Bachelor of Science**, University of Jyväskylä, Finland **Apr, 2012**  
Major subject: physics, minor subjects: mathematics and computer science. Bachelor’s Thesis: “Dirac, Majorana and Weyl fermions”, supervisor Prof Jukka Maalampi.

Graduated from Joensuun Normaalikoulu Upper Secondary School, Finland **May, 2008**

Language skills: Finnish (mother tongue), English (fluent), Swedish (satisfactory), German (basics).

## Teaching

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- Mechanics, teaching assistant, University of Jyväskylä, spring 2016.
- Cosmology, teaching assistant, University of Jyväskylä, spring 2015.
- Mechanics, teaching assistant, University of Jyväskylä, spring 2014.

## Publications

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- **22** research articles.
  - h-index **13**, in total **500** citations (INSPIRE database, August 9, 2018).
- [1] N. Bernal, C. Cosme, T. Tenkanen, and V. Vaskonen, “Scalar singlet dark matter in non-standard cosmologies”, (2018), arXiv:1806.11122 [hep-ph].
  - [2] A. Hektor, G. Hütsi, L. Marzola, and V. Vaskonen, “Constraints on ALPs and excited dark matter from the EDGES 21-cm absorption signal”, (2018), arXiv:1805.09319 [hep-ph].
  - [3] J. Ellis, G. Hütsi, K. Kannike, L. Marzola, M. Raidal, and V. Vaskonen, “Dark Matter Effects On Neutron Star Properties”, Phys. Rev. **D97**, 123007 (2018), arXiv:1804.01418 [astro-ph.CO].
  - [4] A. Hektor, G. Hütsi, L. Marzola, M. Raidal, V. Vaskonen, and H. Veermäe, “Constraining Primordial Black Holes with the EDGES 21-cm Absorption Signal”, Phys. Rev. **D98**, 023503 (2018), arXiv:1803.09697 [astro-ph.CO].
  - [5] S. Fraser, et al., “The EDGES 21 cm Anomaly and Properties of Dark Matter”, (2018), arXiv:1803.03245 [hep-ph].
  - [6] M. Raidal, S. Solodukhin, V. Vaskonen, and H. Veermäe, “Light primordial exotic compact objects as all dark matter”, Phys. Rev. D **97**, 123520 (2018), arXiv:1802.07728 [astro-ph.CO].
  - [7] A. Hektor, K. Kannike, and V. Vaskonen, “Modifying dark matter indirect detection signals by thermal effects at freeze-out”, Phys. Rev. **D98**, 015032 (2018), arXiv:1801.06184 [hep-ph].
  - [8] T. Markkanen, T. Tenkanen, V. Vaskonen, and H. Veermäe, “Quantum corrections to quartic inflation with a non-minimal coupling: metric vs. Palatini”, JCAP **1803**, 029 (2018), arXiv:1712.04874 [gr-qc].
  - [9] J. Ellis, A. Hektor, G. Hütsi, K. Kannike, L. Marzola, M. Raidal, and V. Vaskonen, “Search for Dark Matter Effects on Gravitational Signals from Neutron Star Mergers”, Phys. Lett. **B781**, 607–610 (2018), arXiv:1710.05540 [astro-ph.CO].
  - [10] M. Raidal, V. Vaskonen, and H. Veermäe, “Gravitational Waves from Primordial Black Hole Mergers”, JCAP **1709**, 037 (2017), arXiv:1707.01480 [astro-ph.CO].
  - [11] N. Bernal, M. Heikinheimo, T. Tenkanen, K. Tuominen, and V. Vaskonen, “The Dawn of FIMP Dark Matter: A Review of Models and Constraints”, Int. J. Mod. Phys. **A32**, 1730023 (2017), arXiv:1706.07442 [hep-ph].
  - [12] B. Carr, T. Tenkanen, and V. Vaskonen, “Primordial black holes from inflaton and spectator field perturbations in a matter-dominated era”, Phys. Rev. **D96**, 063507 (2017), arXiv:1706.03746 [astro-ph.CO].
  - [13] B. Carr, M. Raidal, T. Tenkanen, V. Vaskonen, and H. Veermäe, “Primordial black hole constraints for extended mass functions”, Phys. Rev. **D96**, 023514 (2017), arXiv:1705.05567 [astro-ph.CO].
  - [14] L. Marzola, A. Racioppi, and V. Vaskonen, “Phase transition and gravitational wave phenomenology of scalar conformal extensions of the Standard Model”, Eur. Phys. J. **C77**, 484 (2017), arXiv:1704.01034 [hep-ph].
  - [15] V. Vaskonen, “Electroweak baryogenesis and gravitational waves from a real scalar singlet”, Phys. Rev. **D95**, 123515 (2017), arXiv:1611.02073 [hep-ph].
  - [16] T. Alanne, K. Kainulainen, K. Tuominen, and V. Vaskonen, “Baryogenesis in the two doublet and inert singlet extension of the Standard Model”, JCAP **1608**, 057 (2016), arXiv:1607.03303 [hep-ph].
  - [17] T. Tenkanen, K. Tuominen, and V. Vaskonen, “A Strong Electroweak Phase Transition from the Inflaton Field”, JCAP **1609**, 037 (2016), arXiv:1606.06063 [hep-ph].
  - [18] T. Tenkanen, and V. Vaskonen, “Reheating the Standard Model from a hidden sector”, Phys. Rev. **D94**, 083516 (2016), arXiv:1606.00192 [astro-ph.CO].
  - [19] M. Heikinheimo, T. Tenkanen, K. Tuominen, and V. Vaskonen, “Observational Constraints on Decoupled Hidden Sectors”, Phys. Rev. **D94**, 063506 (2016), arXiv:1604.02401 [astro-ph.CO].
  - [20] K. Kainulainen, S. Nurmi, T. Tenkanen, K. Tuominen, and V. Vaskonen, “Isocurvature Constraints on Portal Couplings”, JCAP **1606**, 022 (2016), arXiv:1601.07733 [astro-ph.CO].

- [21] K. Kainulainen, K. Tuominen, and V. Vaskonen, “Self-interacting dark matter and cosmology of a light scalar mediator”, *Phys. Rev.* **D93**, 015016 (2016), arXiv:1507.04931 [hep-ph].
- [22] T. Alanne, K. Tuominen, and V. Vaskonen, “Strong phase transition, dark matter and vacuum stability from simple hidden sectors”, *Nucl. Phys.* **B889**, 692–711 (2014), arXiv:1407.0688 [hep-ph].

## Talks and seminars

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- [1] “Dark matter effects on neutron star properties”, Particle Cosmology in Tampere, Finland, Apr. 19, 2018.
- [2] “Primordial black hole constraints for extended mass functions”, DESY Theory Workshop, Hamburg, Germany, Sept. 28, 2017.
- [3] “Primordial black hole constraints for extended mass functions”, COSMO-17, Paris, France, Aug. 31, 2017.
- [4] “Electroweak baryogenesis in Higgs portal models”, seminar talk, Queen Mary University of London, United Kingdom, Feb. 1, 2017.
- [5] “Electroweak baryogenesis and gravitational waves from the Higgs portal”, Helsinki Higgs Forum, Helsinki, Finland, Dec. 16, 2016.
- [6] “Electroweak baryogenesis and gravitational waves from a real scalar singlet”, seminar talk, NICPB, Tallinn, Estonia, Nov. 17, 2016.
- [7] “Dark matter and baryogenesis in Higgs portal models”, seminar talk, NICPB, Tallinn, Estonia, Sept. 19, 2016.
- [8] “Reheating the standard model from a hidden sector”, Warsaw Workshop on Non-Standard Dark Matter: multicomponent scenarios and beyond, Poland, June 4, 2016.
- [9] “Self-interacting dark matter and cosmology of a light scalar mediator”, The 24th Nordic Particle Physics Meeting, Svingvoll, Norway, Jan. 5, 2016.
- [10] “Self-interacting dark matter and cosmology of a light scalar mediator”, Dark Matter – Cairo, Egypt, Dec. 17, 2015.
- [11] “Self-interacting dark matter and cosmology of a light scalar mediator”, DESY Theory Workshop, Hamburg, Germany, Sept. 30, 2015.
- [12] “Self-interacting dark matter and cosmology of a light scalar mediator”, Finnish Cosmophysics Meeting, Tampere, Finland, Sept. 17, 2015.
- [13] “Strong phase transition and dark matter from a simple hidden sector”, Nordic Winter School on Cosmology and Particle Physics, Svingvoll, Norway, Jan. 4, 2015.
- [14] “Strong phase transition and dark matter from a simple hidden sector”, Particle Physics Day, Jyväskylä, Finland, Oct. 24, 2014.
- [15] “Strong phase transition and dark matter from a simple hidden sector”, Finnish Cosmophysics Meeting, Tampere, Finland, Sept. 26, 2014.