

Research output list

If not specifically indicated otherwise, the following research list is in alphabetical order. In all subsequent research output, I contributed at the level of first or second author, conducted the computations, (co-)led the writing, and developed the main ideas of the project.

Journal articles

- [32] A. Bhatnagar, D. Croon, **P. Schicho**, *Interpreting the 95 GeV resonance in the Two Higgs Doublet Model: Implications for the Electroweak Phase Transition*, (2025), [2506.20716].
- [31] M. Kierkla, N. Ramberg, **P. Schicho**, and D. Schmitt, *Theoretical uncertainties for primordial black holes from cosmological phase transitions*, (2025), [2506.15496].
- [30] F. Bernardo, P. Klose, **P. Schicho**, and T. V. I. Tenkanen, *Higher-dimensional operators at finite-temperature affect gravitational-wave predictions*, (2025), [2503.18904].
- [29] M. Kierkla, **P. Schicho**, B. Swiezewska, T. V. I. Tenkanen, and J. van de Vis, *Finite-temperature bubble nucleation with shifting scale hierarchies*, (2025), [2503.13597].
- [28] A. Ekstedt, O. Gould, J. Hirvonen, B. Laurent, L. Niemi, **P. Schicho**, and J. van de Vis, *How fast does the WallGo? A package for computing wall velocities in first-order phase transitions*, JHEP **04**, 101 (2025), [2411.04970].
- [27] A. Ekstedt, **P. Schicho**, and T. V. I. Tenkanen, *Cosmological phase transitions at three loops: The final verdict on perturbation theory*, Phys. Rev. D **110**, 096006 (2024), [2405.18349].
- [26] M. Lewicki, M. Merchand, L. Sagunski, **P. Schicho**, and D. Schmitt, *Impact of theoretical uncertainties on model parameter reconstruction from GW signals sourced by cosmological phase transitions*, Phys. Rev. D **110**, 023538 (2024), [2403.03769].
- [25] J. Ghiglieri, **P. Schicho**, N. Schlusser, and E. Weitz, *The force-force correlator at the hard thermal scale of hot QCD*, JHEP **03**, 111 (2024), [2312.11731].
- [24] C. Lwowski, K. Kaiser, J. Bucur, **P. Schicho**, and T. Kohnen, *Accuracy of using the axial length of the fellow eye for IOL calculation in retinal detachment eyes undergoing silicone oil removal*, Br. J. Ophthalmology (2023) 10.1136/bjo-2023-323581.
- [23] J. Österman, **P. Schicho**, and A. Vuorinen, *Integrating by parts at finite density*, JHEP **08**, 212 (2023), [2304.05427].
- [22] L. Sagunski, **P. Schicho**, and D. Schmitt, *Supercool exit: Gravitational waves from QCD-triggered conformal symmetry breaking*, Phys. Rev. D **107**, 123512 (2023), [2303.02450].

- [21] A. Ekstedt, **P. Schicho**, and T. V. I. Tenkanen, *DRalgo: A package for effective field theory approach for thermal phase transitions*, Comput. Phys. Commun. **288**, 108725 (2023), [2205.08815].
- [20] T. Gorda, A. Kurkela, J. Österman, R. Paatelainen, S. Säppi, **P. Schicho**, K. Seppänen, and A. Vuorinen, *Degenerate fermionic matter at N³LO: Quantum electrodynamics*, Phys. Rev. D **107**, L031501 (2023), [2204.11893].
- [19] T. Gorda, A. Kurkela, J. Österman, R. Paatelainen, S. Säppi, **P. Schicho**, K. Seppänen, and A. Vuorinen, *Soft photon propagation in a hot and dense medium to next-to-leading order*, Phys. Rev. D **107**, 036012 (2023), [2204.11279].
- [18] J. Löfgren, M. J. Ramsey-Musolf, **P. Schicho**, and T. V. I. Tenkanen, *Nucleation at Finite Temperature: A Gauge-Invariant Perturbative Framework*, Phys. Rev. Lett. **130**, 251801 (2023), [2112.05472].
- [17] **P. Schicho**, T. V. I. Tenkanen, and G. White, *Combining thermal resummation and gauge invariance for electroweak phase transition*, JHEP **11**, 047 (2022), [2203.04284].
- [16] S. Biondini, **P. Schicho**, and T. V. I. Tenkanen, *Strong electroweak phase transition in t-channel simplified dark matter models*, JCAP **10**, 044 (2022), [2207.12207].
- [15] J. Hirvonen, J. Löfgren, M. J. Ramsey-Musolf, **P. Schicho**, and T. V. I. Tenkanen, *Computing the gauge-invariant bubble nucleation rate in finite temperature effective field theory*, JHEP **07**, 135 (2022), [2112.08912].
- [14] J. Ghiglieri, G. D. Moore, **P. Schicho**, and N. Schlusser, *The force-force-correlator in hot QCD perturbatively and from the lattice*, JHEP **02**, 58 (2022), [2112.01407].
- [13] L. Niemi, **P. Schicho**, and T. V. I. Tenkanen, *Singlet-assisted electroweak phase transition at two loops*, Phys. Rev. D **103**, 115035 (2021), [2103.07467].
- [12] D. Croon, O. Gould, **P. Schicho**, T. V. I. Tenkanen, and G. White, *Theoretical uncertainties for cosmological first-order phase transitions*, JHEP **04**, 055 (2021), [2009.10080].
- [11] **P. M. Schicho**, T. V. I. Tenkanen, and J. Österman, *Robust approach to thermal resummation: Standard Model meets a singlet*, JHEP **06**, 130 (2021), [2102.11145].
- [10] M. Laine, **P. Schicho**, and Y. Schröder, *A QCD Debye mass in a broad temperature range*, Phys. Rev. D **101**, 023532 (2020), [1911.09123].
- [9] M. Laine, **P. Schicho**, and Y. Schröder, *Soft thermal contributions to 3-loop gauge coupling*, JHEP **2018**, 37 (2018), [1803.08689].

Conference proceedings

- [8] J. Ghiglieri, G. D. Moore, **P. Schicho**, N. Schlusser, and E. Weitz. *Hard parton dispersion in the quark-gluon plasma, non-perturbatively*. In *11th International Conference on Hard and Electromagnetic Probes of High-Energy Nuclear Collisions* (July 2023). [2307.09297].
- [7] G. Aarts, J. Aichelin, C. Allton, A. Athenodorou, D. Bachtis, C. Bonanno, N. Brambilla, E. Bratkovskaya, M. Bruno, M. Caselle, C. Conti, R. Contino, L. Cosmai, F. Cuteri, L. Del Debbio, M. D’Elia, P. Dimopoulos, F. Di Renzo, T. Galatyuk, J. N. Guenther, R. Houtz, F. Karsch, A. Y. Kotov, M. P. Lombardo, B. Lucini, L. Maio, M. Panero, J. M. Pawłowski, A. Pelissetto, O. Philipsen, A. Rago, C. Ratti, S. M. Ryan, F. Sannino, C. Sasaki, **P. Schicho**, C. Schmidt, S. Sharma, O. Soloveva, M. Sorba, and U.-J. Wiese. *Phase Transitions in Particle Physics – Results and Perspectives from Lattice Quantum Chromo-Dynamics*. In (Jan. 2023). [2301.04382].
- [6] M. Fraser, D. Björkman, K. Cornelis, B. Goddard, V. Kain, **P. Schicho**, C. Theis, and H. Vincke. *Modelling the Radioactivity Induced by Slow-Extraction Losses in the CERN SPS*. In *Proc. of International Particle Accelerator Conference (IPAC’17)* (May 2017), 1897–1900.
- [5] M. A. Fraser, R. G. Alia, B. Balhan, H. Bartosik, C. Bertone, D. Björkman, J. Borburgh, N. Conan, K. Cornelis, L. Gatignon, B. Goddard, Y. Kadi, V. Kain, A. Mereghetti, F. Roncarolo, **P. M. Schicho**, J. Spanggaard, O. Stein, L. Stoel, F. M. Velotti, and H. Vincke. *SPS Slow Extraction Losses and Activation: Challenges and Possibilities for Improvement*. In *Proc. of International Particle Accelerator Conference (IPAC’17)* (Copenhagen. 2017), 611–614.

Theses

- [4] **P. M. Schicho**, *Multi-loop investigations of strong interactions at high temperatures*, PhD thesis (U. Bern, 2020).
- [3] **P. M. Schicho**, *Inhomogeneous condensation in quark-based QCD effective models via wavelet pseudoparticles*, MA thesis (ETH Zürich, 2016).
- [2] **P. Schicho**, *π - and ρ -Meson mass spectroscopy from Lattice QCD*, BA thesis (TU Graz, 2014).
- [1] **P. Schicho**, *Increasing the sensitivity of a search for supersymmetry in the single lepton channel with the Transverse Mass*, Project thesis (HEPHY Vienna, 2014).

Invited talks at workshops

04/08/2025 *Perturbative cosmological phase transitions in a broad temperature range*, invited **ple-**



nary talk at *Numerical simulations of early Universe sources of gravitational waves* at NORDITA, Stockholm, Sweden

- 05/03/2025 *Limits and limitations of perturbative approaches to cosmological phase transitions*, invited talk at GW day at CERN, Geneva, Switzerland
- 08/10/2024 *Reliable theoretical predictions for GWs from first-order phase transitions*, invited **plenary** talk at *Fun with the phases of the Universe* at IFPU, Trieste, Italy
- 20/09/2024 *Reliable theoretical predictions for GWs from first-order phase transitions*, invited **plenary** talk at *Fundamental physics and gravitational wave detectors* at Pollica physics center, Italy
- 19/03/2024 *Strong cosmological phase transitions through the EFT lens*, invited **plenary** talk at *Quarkonia meet Dark Matter* at Institute for Advanced Study, Technical University of Munich, Germany
- 05/12/2022 *EFT framework for (precision) cosmological phase transition thermodynamics*, invited **plenary** talk at *What the heck happens when the Universe boils?* at Kavli IPMU, Tokyo, Japan

Contributed talks

- 06/06/2025 *Higher-dimensional operators at finite-temperature affect gravitational-wave predictions*, contributed talk at Swiss Cosmology Days 2025, ETH Zürich, Switzerland
- 05/06/2025 *Higher-dimensional operators at finite-temperature affect gravitational-wave predictions*, contributed talk at HEFT 2025, Geneva, Switzerland
- 21/02/2025 *Completing the perturbative program for cosmological phase transitions*, contributed talk at KEK theory meeting on particle physics phenomenology (KEK-PH2025winter), Tsukuba, Japan
- 04/09/2024 *Finite-temperature effective theories for first-order cosmological phase transitions*, contributed talk at High-Energy Theoretical Particle Physics Mini-Conference, Genève, Switzerland
- 14/09/2023 *Phase transition thermodynamic parameters at high precision*, contributed talk at 26th International Conference on Particle Physics and Cosmology (COSMO'23), Madrid, Spain
- 11/07/2023 *Degenerate fermionic matter at N^3LO* , contributed talk at ELEMENTS Annual Conference, Bad Nauheim, Germany
- 03/07/2023 *Can EFT reveal if there was an electroweak phase transition?*, contributed talk at Cosmology from Home



- 22/06/2023 PRECLISA. *Gravitational waves from cosmological phase transitions: Precision cosmology in the light of LISA*, interview talk for the Ambizione grant of the Swiss National Science Foundation, Bern, Switzerland
- 17/05/2023 *Phase transition thermodynamic parameters at high precision*, contributed talk at How fast does the bubble grow?, DESY, Hamburg, Germany
- 05/05/2023 *Strong electroweak phase transition and simplified dark matter models*, contributed talk at Progress on Old and New Themes in cosmology (PONT) 2023, Avignon, France
- 20/06/2022 *Jet dispersion in hot QCD from the lattice*, contributed talk at SEWM 2022, Paris, France
- 06/04/2022 *(Non-)perturbative jet dispersion hot QCD*, contributed talk at Quark Matter 2022, Kraków, Poland
- 30/03/2022 *(Non-)perturbative jet dispersion hot QCD*, contributed talk at Mini workshop: Phase transitions in particle physics, Galileo Galilei Institute, Firenze, Italy
- 29/03/2021 *Soft thermal contributions to 3-loop gauge coupling*, contributed parallel talk at Fun-QCD (online), Barcelona, Spain
- 28/06/2018 *Fun with thermal dimension-six operators*, contributed parallel talk at SEWM 2018, Barcelona, Spain

Seminar talks

- 27/03/2025 *Limits and limitations of perturbative approaches to cosmological phase transitions*, invited seminar talk at Warsaw University, Poland
- 26/02/2025 *Perturbative cosmological phase transitions and their bubble wall velocities*, invited seminar talk at Kavli IPMU, Tokyo, Japan
- 10/06/2024 *Completing the perturbative program for cosmological phase transitions*, invited seminar talk at Bielefeld University, Germany
- 23/11/2023 *Impact of computational diligence on GW signals from phase transitions*, invited seminar talk at Warsaw University, Poland
- 12/10/2023 *Impact of computational diligence on GW signals from phase transitions*, invited seminar talk at University of Basel, Basel, Switzerland
- 19/09/2023 *Impact of computational diligence on GW signals from phase transitions*, invited seminar talk at Helsinki Institute of Physics, Helsinki, Finland
- 15/06/2023 *Electroweak phase diagram at finite lepton number density*, contributed talk at Thermal Field Theory meets Phenomenology, Uppsala, Sweden
- 30/05/2023 *High-temperature effective field theories: Precision phase transition thermodynamics*, seminar talk at HEP seminar, Université de Genève, Switzerland

- 10/05/2023 *Integrating by parts at finite density*, informal talk at the DMGW meeting, Goethe University, Frankfurt, Germany
- 25/01/2023 *Degenerate fermionic matter at N^3LO* , invited seminar talk at Gravitation and Cosmology seminar, Utrecht University, Netherlands
- 24/01/2023 *What can EFT tell us about the electroweak phase transition?*, seminar talk at CRC-TR211 meeting and Colloquium, Bielefeld University, Germany
- 08/11/2022 *EFT framework for cosmological phase transition thermodynamics*, seminar talk at the AstroCoffee, Goethe University, Frankfurt, Germany
- 13/10/2022 *Degenerate fermionic matter at N^3LO* , invited seminar talk (online) at S@INT seminar, INT, Seattle, USA
- 15/09/2022 *(Gauge independent) Bubble nucleation rate at finite temperature*, invited seminar talk at Jožef Stefan Institute, Ljubljana, Slovenia
- 24/08/2022 *Can EFT tell us if there was an electroweak phase transition?*, invited seminar talk at University of Graz, Graz, Austria
- 11/07/2022 *Soft light-cone observables from electrostatic QCD*, invited seminar talk (online) at the QCD theory seminar
- 07/07/2022 *Degenerate fermionic matter at N^3LO* , invited seminar talk at the Nuclear Physics Colloquium, Goethe University, Frankfurt, Germany
- 16/06/2022 *Can EFT tell us if there was an electroweak phase transition?*, invited seminar talk at SUBATECH, Nantes, France
- 31/05/2022 *Electroweak phase transition: Combining thermal resummation and gauge invariance*, invited seminar talk at NICPB, Tallinn University, Estonia
- 24/05/2022 *Combining thermal resummation and gauge invariance for electroweak phase transition*, invited seminar talk (online) at School of Physics and Astronomy, Monash University, Australia
- 03/03/2022 *Effective theory approach to cosmological phase transitions*, invited seminar talk at Instituto de Astrofísica de Canarias, La Laguna, Spain
- 28/10/2021 *Gauge independent bubble nucleation rate at finite temperature*, invited seminar talk at University of Basel, Basel, Switzerland
- 19/10/2021 *Cosmological phase transition: Robust thermal resummation*, invited seminar talk at University of Bern, Bern, Switzerland
- 13/05/2021 *Cosmological phase transition: Robust thermal resummation*, invited seminar talk (online) at KIAS, Seoul, South Korea
- 25/11/2020 *How to be precise at the electroweak scale at finite-temperature*, invited seminar talk (online) at Kavli IPMU, Tokyo, Japan

- 13/08/2019 *3-Loop Gauge Coupling in Hot Yang-Mills*, invited seminar talk at Helsinki Institute of Physics, Helsinki, Finland
- 28/08/2018 *Fun with thermal dimension-six operators*, invited seminar talk at Universidad del Bío-Bío, Chillán, Chile