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

[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*, (2024), [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. Pawlowski, 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 Stransverse Mass*, Project thesis (HEPHY Vienna, 2014).

Invited talks at workshops

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

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 FunQCD (online), Barcelona, Spain

28/06/2018 *Fun with thermal dimension-six operators*, contributed parallel talk at SEWM 2018, Barcelona, Spain

Seminar talks

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