TOBI HAAS

PostDoc in Theoretical Physics

hi@tobi-haas.de · +32 2650 3142 · QuIC @ ULB, Brussels

tobi-haas.de · 0000-0003-1477-9855

INTERESTS

Information | Fields | Gravity | Cold Atoms | Entanglement | Uncertainty | Thermalization | Quanta in curved space

SERVICE

Teaching: 9 bachelor tutorials & 1 master seminar

Co-supervised bachelor's: Johannes Schmidt, Salome Schwark, Sara Ditsch, Henrik Müller-Groeling & Ben Höber

Co-supervised master's: Benoît Dubus, Kobe Vergaerde, Mireia Tolosa-Simeón, Álvaro Parra-López & Neil Dowling

Refereeing: Nature Commun., Phys. Rev. Lett., Phys. Rev. A & PRX Quantum

AWARDS

Skipped 7th grade

Academic studies in physics and mathematics during high school in Darmstadt

Teaching awards in Darmstadt and Heidelberg

REFEREES

Nicolas Cerf

quic.ulb.ac.be

nicolas.cerf@ulb.be

Martin Gärttner

mbqd.de

martin.gaerttner@uni-jena.de

Markus Oberthaler

synqs.de

markus.oberthaler@kip.uni-heidelberg.de

ACADEMIC RECORD

Postdoctoral Fellow

05/2022 - now · Universite libré de Bruxelles · Nicolas Cerf

Dr. rer. nat. in Physics

03/2019 – 04/2022 · Heidelberg University · Stefan Flörchinger

Thesis: An Entropic Perspective on Equilibrium, Uncertainty and Entanglement

M. Sc. in Physics

10/2016 – 10/2018 · Heidelberg University · Jan Pawlowski

Thesis: Higher derivative quantum gravity in different approximations

B. Sc. in Physics

10/2013 – 09/2016 · TU Darmstadt · Barbara Drossel

Thesis: Top-down causation in the quantum mechanical measurement process

PUBLICATIONS

Yannick Deller *et al.*, **Area laws for classical entropies in a spin-1 Bose-Einstein condensate**, arXiv:2404.12323

Yannick Deller *et al.*, **Area laws and thermalization from classical entropies in a Bose-Einstein condensate**, arXiv:2404.12321

T. Haas, **Area laws from classical entropies**, arXiv:2404.12320

N. J. Cerf, T. Haas, **Information and majorization theory for fermionic phase-space distributions**, arXiv:2401.08523

S. Ditsch, T. Haas, **Entropic distinguishability of quantum fields**, arXiv:2307.06128

C. Griffet, T. Haas, N. J. Cerf, **Accessing continuous-variable entanglement witnesses with multimode spin observables**, PRA 108, 022421

M. Gärttner, T. Haas, J. Noll, **General class of continuous variable entanglement criteria**, PRL 131, 150201

M. Gärttner, T. Haas, J. Noll, **Detecting continuous variable entanglement in phase space with the Q-distribution**, PRA 108, 042410

C. Viermann *et al.*, **Quantum field simulator for dynamics in curved spacetime**, Nature 611, 260–264

M. Tolosa-Simeón *et al.*, **Curved and expanding spacetime geometries in Bose-Einstein condensates**, PRA 106, 033313

N. Sánchez-Kuntz *et al.*, **Scalar quantum fields in cosmologies with 2+1 spacetime dimensions**, PRD 105, 105020

S. Floerchinger, T. Haas, Markus Schröfl, **Relative entropic uncertainty relation for scalar quantum fields**, SciPost Phys. 12, 089

S. Floerchinger, M. Gärttner, T. Haas, O. Stockdale, **Entropic entanglement criteria in phase space**, PRA 105, 012409

S. Floerchinger, T. Haas, H. Müller-Groeling, **Wehrl entropy, entropic uncertainty relations, and entanglement**, PRA 103, 062222

S. Floerchinger, T. Haas, B. Hoeber, **Relative entropic uncertainty relation**, PRA 103, 062209

S. Floerchinger, T. Haas, **Second law of thermodynamics for relativistic fluids formulated with relative entropy**, PRD 102, 105002

S. Floerchinger, T. Haas, **Thermodynamics from relative entropy**, PRE 102, 052117