
Aleksi Kurkela



PERSONAL INFORMATION

Full Name: Eero Aleksi Kurkela
Nationality: Finnish
Birth: September 6th 1982, Hämeenlinna, Finland
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CURRENT ACADEMIC POSITIONS

Associate Professor, *University of Stavanger* 2015 -

PAST APPOINTMENTS

Staff member, <i>CERN-TH</i>	9/2015 - 9/2020
CERN Marie Curie Fellow, <i>CERN PH-TH</i>	10/2013 - 9/2015
Postdoctoral Research Associate, <i>McGill University</i>	10/2010 - 10/2013
Postdoctoral Research Associate, <i>ETH Zürich</i>	10/2008 - 10/2010
Research Fellow, <i>University of Helsinki</i>	9/2006 - 9/2008
Research Assistant, <i>University of Helsinki</i>	5/2005 - 9/2006

EDUCATION

Docent (adjunct professor) in Theoretical physics, <i>University of Helsinki</i>	2014
Ph.D. in Theoretical physics, <i>University of Helsinki</i>	2006-2008
B.Sc. and M.Sc. in Physics, <i>University of Helsinki</i>	2002-2006

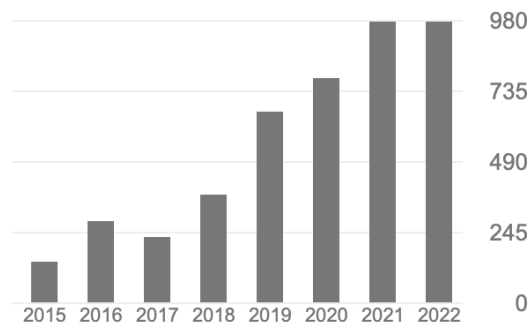
AWARDS

Zimanyi Nuclear Theory Award recognizing an *exceptionally accomplished early career theorist whose work has had major and broad impact in the field of high energy nuclear physics* awarded for **pioneering work on field theory applications to the QCD equilibration mechanisms tested in heavy ion collisions and to the QCD equation of state tested in neutron star mergers**, at the Quark Matter conference, Wuhan, November 2019.

Lyse Research Award, annual award for outstanding research at UiS, Norway, 2020.

PUBLICATIONS

56 refereed publications in various journals including **Nature physics**, **PRX**, **PRL (12)**, Phys. Rept., PLB (2), PRD (12), PRC, JHEP (14), EPJC, Astrophys. J, ApJL, JCAP. **Total citations 4711, h-index: 37** (INSPIRES 11/2022). Number of citations per year from google scholar:



Selected papers:

1. O. Komoltsev, A. Kurkela,
How Perturbative QCD Constrains the Equation of State at Neutron-Star Densities
Phys.Rev.Lett. **128** (2022) 20, 202701, (**26 citations**)
2. E. Annala, T. Gorda, A. Kurkela, J. Nättilä and A. Vuorinen,
Evidence for quark-matter cores in massive neutron stars,
Nature Phys. **16** (2020) no.9, 907-910 (**300 citations**)
3. E. Annala, T. Gorda, A. Kurkela and A. Vuorinen,
Gravitational-wave constraints on the neutron-star-matter Equation of State
Phys. Rev. Lett. **120** (2018) no.17, 172703 (**621 citations**)
4. A. Kurkela and A. Mazeliauskas,
Chemical Equilibration in Hadronic Collisions,
Phys. Rev. Lett. **122** (2019), 142301 (**45 citations**)
5. A. Kurkela and Y. Zhu,
Isotropization and hydrodynamization in weakly coupled heavy-ion collisions,
Phys. Rev. Lett. **115** (2015) no.18, 182301 (**202 citations**)
6. A. Kurkela and E. Lu, (**101 citations**)
Approach to Equilibrium in Weakly Coupled Non-Abelian Plasmas, Phys. Rev. Lett. **113**
(2014) no.18, 182301
7. A. Kurkela, P. Romatschke and A. Vuorinen, *Cold Quark Matter,*
Phys. Rev. D **81** (2010), 105021 (**342 citations**)

Papers 1,4,5 and 6 are two-author **PRL** publications with student (1,4,6) or early postdoc (5) collaborators. I judge that papers 2,3,5 are my most impactful publications.

GRANTS AND FELLOWSHIPS

UH-nett Vest (the University and College Network for Western Norway), 200kNOK 2018
Marie Curie (COFUND) fellowship at CERN-TH 2013 - 2015
Institute for Particle Physics Theory Postdoctoral Fellowship (Canada), \$40k 2011-2013
Academy of Finland, Fellowship for Researcher Training and Research Abroad, 21k€ 2008-2009

TEACHING EXPERIENCE

Formal qualifications: Qualification of docent (adjunct professor), including formal evaluation of teaching skills
University of Helsinki, October, 2014.

Lecturing at undergraduate level:

- **MAF310, Numerical modelling**, $26 \times 2\text{h}$ lectures, Stavanger, 2021 , 2022
- **MAF300, Numerical modelling**, $26 \times 2\text{h}$ lectures + $13 \times 4\text{h}$ lab, 170 students. Development of a new course on numerical methods for physicists and engineers including theory module (lectures) and hands-on problem solving lab using Python. Stavanger 2020

Lecturing at graduate level:

- **PHYS 744, Thermal Field Theory**, $26 \times 80\text{min}$ lectures, McGill University, 2011
- **Invited lecturer** at various international topical graduate schools:
 - **pQCD kinetic theory** $4 \times 90\text{min}$ lectures
The myriad colorful ways of understanding extreme QCD matter, ICPT Bangalore, 2019
 - **QCD Kinetic Theory And Thermalization**, 2ECTS, $7 \times 2\text{h}$ lectures
The 26th Jyväskylä summer school, Jyväskylä, 2016
 - **Heavy-Ion physics**, $2 \times 90\text{min}$ lectures
CERN-JIRN European school of high-energy physics, Gausdal, 2016
 - **Electromagnetic Probes Theory**, $2 \times 90\text{ min}$ lectures
4th Intl. Conference on Hard Probes of High-Energy Nuclear Collisions, McGill, 2015

- **Thermal QCD** $3 \times 60\text{min}$
International JET Collaboration Graduate Summer School, McGill, 2012
- **Thermal field theory at finite density** $3 \times 60\text{min}$
International Graduate School on Aspects of QCD at Finite Density Bielefeld, 2011

SUPERVISION

- **Supervision of MSc and BSc students:** Amanda Kjærnsmo, Marianne Udtian (2020-2021)
- **Supervision of PhD students:** Saga Säppi (Helsinki, PhD 2020), Eemeli Annala (Helsinki, PhD 2020) Oleg Komoltsev (Stavanger). In addition, while I have closely interacted and contributed to the supervision of multiple students: Egang Lu (McGill, PhD 2014), Mark York (McGill, PhD 2014), Michela D’Onofrio (Helsinki, PhD 2014), Alexas Mazeliauskas (Stony Brook, PhD 2016), Jarkko Peuron (Jyväskylä, PhD 2017), Alexander Soloviev (TU Vienna, PhD 2019), Robin Törnkvist (Lund)
- **Supervision of post-doctoral fellows:**
Konrad Tywoniuk (2015-2017), Jacopo Ghiglieri (2016-2019), Bin Wu (2017-2020), Risto Paatelainen (2018-2020), Wilke van der Schee (2019-2020), Aleksas Mazeliauskas (2019-2020)

MANAGEMENT EXPERIENCE

- At CERN-TH (2015-2020), as a senior scientist I managed a group totalling 6 postdocs and various students. Oversight, supervision, mentoring, administration, coordination and committee work. I served as the Coordinator for EU relations, the Coordinator for Nordic relations (including ministerial visits), and as Member of the Fellows and Associates Committee (with an annual budget of approximately 4500kCHF), and member of Visitors Committee (annual budget of 800kCHF). I was the first responsible for Diversity, Inclusion and Equity and first TH representative in CERN-wide diversity committee.
- **International conference organization:**
 - Member of LOC: The XIVth **Quark confinement and the Hadron spectrum** conference (~ 400 participants) Stavanger, 2022
 - Member of the Program Committee: The Ninth Annual Conference on **Large Hadron Collider Physics** (~ 1300 participants) Paris, 2021
 - Member IAC and discussion leader: The 6th Intl **Conference on the Initial Stages of High-Energy Nuclear Collisions**, (~ 150 participants) Weizmann Institute, 2020
 - Member of LOC: 12th international conference on **Strong and Electroweak Matter**, (~ 90 participants) Stavanger, 2016
 - Member of LOC and programming committee: The 3rd Intl **Conference on the Initial Stages in High-Energy Nuclear Collisions**, (~ 120 participants) Lisbon, 2016
- **International workshops:**
 - Institute for Nuclear Theory programme on **Equilibration mechanism in weakly and strongly coupled quantum field theories** INT Seattle, 2016
 - CERN-TH institute on **Big Bang and the little bangs — Non-equilibrium phenomena in cosmology and in heavy-ion collisions** CERN, 2016
 - CERN-TH institute on **From quarks to gravitational waves: Neutron stars as a laboratory for fundamental physics** CERN, 2016
 - CERN-TH institute on **Recent developments in thermal field theory** CERN, 2018
 - Workshop on **Fire and ice: Hot QCD meets cold and dense matter** Saariselkä, 2018
 - UH-nett Vestland network for nuclear matter research workshop **Quo vadis QCD theory**, Stavanger, 2019

PROFESSIONAL ACTIVITIES

- **Member of the editorial board/Associate editor** for European Physics Journal C, 2016-
- Referee for European Physics Journal A, European Physics Journal C, Physical Review D, Physics Letters B, Physical Review Letters, and Journal of High Energy Physics.
- Grant reviewer for Trond Mohn Stiftelse (2017)
- Member of High-Luminosity LHC (HL-LHC) small systems working group (WG5 2018)
- Member of “Dense Matter” Science Working Group for LOFT (Large Observatory For X-ray Timing).
- Member of eXTP consortium (dense matter working group), associate member of LISA consortium (astrophysics working group).
- Member of the International Astronomical Union
- Pre-examiner for doctoral dissertation: Tuomas Tenkanen (2018), Univ. Helsinki

INVITED PLENARY TALKS AT MAJOR INTERNATIONAL CONFERENCES

50 talks at conferences/workshops, 40 as invited plenary speaker (13 in conferences) 12 invited Colloquia and 40 invited seminars in different research institutes and universities (in 2020: Univ. Frankfurt (**QCD in the cores of neutron stars**), New York Univ., Arizona State Univ., Institute for Nuclear Theory Seattle, McGill University, University of Maryland, and Institute of Modern Physics Lanzhou (**Quark cores in neutron stars**))

How can one tell if there is quark matter in neutron stars? Kurchatov Institute, November 2020
International Workshop on High Energy Physics Hot problems of Strong Interactions

Heavy-ion physics Spatind 2018, January 2018
25th Nordic conference on particle physics

QCD kinetic theory and its applications Thessaloniki, August 2016
XIIth Quark Confinement and the Hadron Spectrum

Phenomenology of Heavy Ions and LQCD Southampton, July 2016
Lattice 2016, The 34th International Symposium on Lattice Field Theory

Hydrodynamization in weakly-coupled heavy-ion collisions Stavanger, July 2016
12th International conference on Strong and Electroweak Matter

Far-from-equilibrium plasmas Blois, May 2016
XXVIIIth Rencontres de Blois, Particle Physics & Cosmology

Initial state of the heavy-ion collisions: thermalization and isotropization Kobe, September 2015
Quark Matter 2015, International conference on ultrarelativistic heavy-ion collisions

Bottom-up thermalization and heavy-ion collisions Napa, December 2014
International conference on the Initial Stages of High-Energy Nuclear Collisions

Thermalization at weak coupling Illa da Toxa, September 2013
International conference on the Initial Stages of High-Energy Nuclear Collisions

Thermalization in collisions of large nuclei at high energies University of Swansea, July 2012
10th International conference on Strong and Electroweak Matter

Large extra dimensions and lattices Lake Tahoe, July 2011
Lattice 2011, The 29th International Symposium on Lattice Field Theory
EoS of cold quark matter Mardid, August 2010

Quark Confinement and Hadron Spectrum IX

Dimensional reduction near deconfinement transition Vienna, November 2009
6th Vienna Central European Seminar on Particle Physics and Quantum Field Theory

OUTREACH

Regular ($\sim 20/\text{year} \times 5 \text{ years} \approx 100$) introductory talks to high school student groups visiting CERN
(*Universe on a blackboard, theorist's view to particle physics*). 2013 - 2020

Multiple talks and events on neutron stars physics at the Stavanger astronomical society 2019 -

LANGUAGE SKILLS

Finnish (Native), English (Fluent), French (Intermediate $\sim B2$), German (Basic $\sim B1$), Swedish and Norwegian (Satisfactory)