

N-PACT Compilation 2020

Norwegian Particle, Astroparticle
and Cosmology Theory community

Introduction

N-PACT is a network aimed at all researchers at Norwegian academic institutions (and Norwegians at CERN) working on Theoretical Particle physics, Astroparticle physics, or Cosmology. The network compiles an annual summary of the combined scientific activity of the network members (this document), and runs an annual workshop and an email list: npact@uis.no. Workshop venues: 19.-22. June 2017, University of Stavanger, 28.-31. May 2018, University of Stavanger, 5.-6. August 2019, University of Oslo. Jun 2020, University of Agder (cancelled due to COVID-19). The 25. June 2021, University of Stavanger (Fysikermøte 2021).

N-PACT now enters as the official entity for PACT in the Norwegian contribution to the European Particle Physics Strategy Document (*Research Plans of the Norwegian Particle, Astroparticle and Nuclear Physics Communities till 2025*). It is stated:

For Norwegian theory, activities at and in connection with CERN play a major role, but rather than focusing on a specific experiment, the theory community takes a broader view and combines its interest in not only particle physics but also astrophysics and cosmology in the N-PACT theory collaboration. It is important that these theory activities be given an enhanced visibility in the European Strategy Update.

And in the section devoted to theory research activities, it says:

The Norwegian community in particle, astroparticle, and cosmology theory (NPACT) is coalescing and is represented here in a single section. A new networking activity has been initiated, connecting all six institutions where theory activities currently exist. As the result of a recent generational turnover, the majority of the network members are newly appointed staff at the six institutions and are of relatively young age (< 50 y). The network is working towards net growth, as well as increasing Norway's participation in CERN theory activities and the Norwegian quota there. To be successful, we see a need for funding opportunities for theory activities distinct from experiments, mirroring the role played by the Theoretical Physics Division at CERN.

This is then followed by a description of the specific PACT research activities.

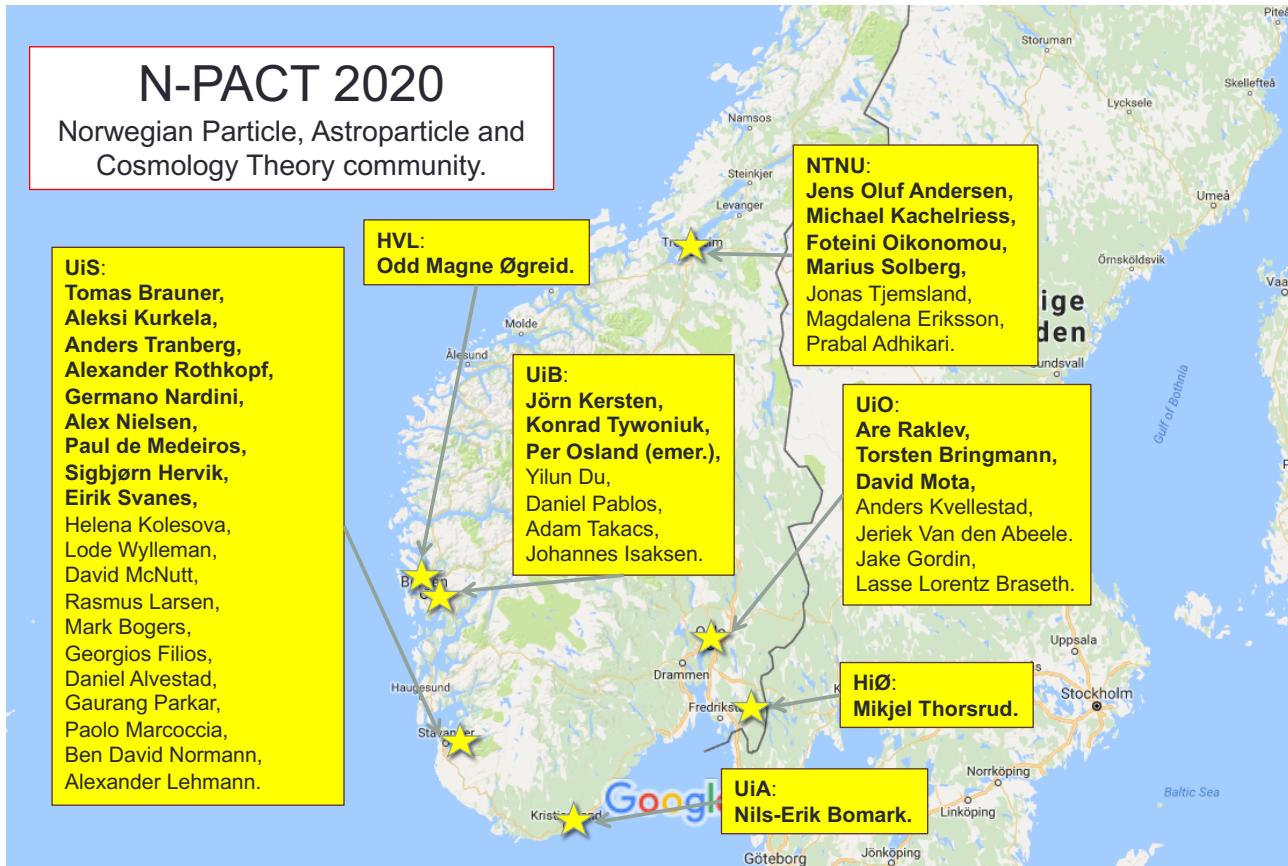


Figure 1: Network members and their affiliations in Norway

Member profiles

University of Agder



Nils-Erik Bomark,
Associate Professor.

At UiA since 2015. SUSY phenomenology, NMSSM, Dark Matter. How to teach particle physics non-technically.

University of Bergen



Jörn Kersten,
Professor.

At UiB since 2014. SUSY phenomenology, self-interacting dark matter, physics of the early universe, cosmology, neutrino physics.



Per Osland,
Professor (emer.).

At UiB since 1987. Particle phenomenology, Extended Higgs sector, CP violation, Dark Matter.



Konrad Tywoniuk,
Researcher (Group Leader).

At UiB since 2018. Heavy-ion physics, hard probes (jet quenching, heavy bosons), finite temperature theory, cosmology.



Yilun Du,
Postdoc.

At UiB since 2019. Heavy-ion physics, jet quenching.



Daniel Pablos,
Postdoc.

At UiB since 2019. Heavy-ion physics, jet quenching.



Adam Takacs,
Ph.D. student

At UiB since 2019. Heavy-ion physics, jet quenching.



Johannes Iaksen,
Ph.D. student.

At UiB since 2020. Heavy-ion physics, jet quenching.

University of Oslo



Are Raklev,
Professor.

At UiO since 2010. Particle Phenomenology, SUSY, Dark Matter. LHC, CERN, GAMBIT.



Torsten Bringmann,
Professor.

At UiO since 2013. BSM particle physics and cosmology. Astrophysical probes of dark matter: indirect detection and structure formation. Dark-SUSY, GAMBIT, CTA.



David Mota,
Professor.

At UiO since 2011. General Relativity, Cosmology.



Anders Kvellestad,
Postdoc.

At UiO/Imperial College since 2017. BSM global fits, LHC phenomenology, supersymmetry, two-Higgs-doublet models, machine learning and Bayesian methods. GAMBIT.



Jake Gordin,
Ph.D. student

At UiO since 2018. High energy astrophysics.



Lasse Lorentz Braseth,
Ph.D. student.

At UiO since 2020.



Jeriek Van den Abeele,
Ph.D. student.

At UiO since 2017. Astroparticle physics, Dark Matter.

University of Stavanger



Anders Tranberg,
Professor.

At UiS since 2013. Finite temperature and out-of-equilibrium field theory, cosmology, baryogenesis, inflation and gravitational waves. CERN, LISA.



Tomas Brauner,
Professor.

At UiS since 2015. Finite-temperature and -density field theory, phase diagram of QCD, effective field theory, spontaneous symmetry breaking.



Sigbjørn Hervik,
Professor.

At UiS since 2009. GR, Modified Gravity, Differential Geometry.



Alex Nielsen,
Associate Professor (emer.).

At UiS since 2019. Gravitational waves, General Relativity, Black holes



Aleksi Kurkela,
Associate Professor.

At UiS/CERN since 2014. Heavy-ion collisions, QCD at finite temperature, density. Compact stars. LHC, CERN.



Germano Nardini,
Associate Professor.

At UiS since 2018. Cosmological phase transitions, gravitational waves, beyond Standard Model physics.



Alexander Rothkopf,
Associate Professor.

At UiS since 2018. Lattice QCD, numerical field theory, out-of-equilibrium field theory.



Eirik Svanes,
Associate Professor.

At UiS since 2019. String theory, mathematical physics.



Paul de Medeiros,
Associate Professor.

At UiS since 2017. Mathematical Physics, String theory.



David McNutt
Associate Professor.

At UiS since 2017. General Relativity, Cosmology.



Lode Wylleman,
Postdoc.

At UiS since 2018. General Relativity, Cosmology.



Helena Kolesova,
Postdoc.

At UiS since 2018. Finite-temperature field theory, symmetry breaking.



Rasmus Larsen,
Postdoc.

At UiS since 2020. Lattice field theory, QCD.



Georgios Filios,
Ph.D. student.

At UiS since 2018. Effective Field Theory, phases of QCD.



Mark Bogers,
Ph.D. student.

At UiS since 2015. Symmetry breaking in quantum field theory.



Daniel Alvestad,
Ph.D. student.

At UiS since 2019. Lattice field theory, Monte Carlo simulations.



Ben David Normann,
Ph.D. student.

At UiS since 2015. Anisotropic cosmological models.



Paolo Marcoccia,
Ph.D. student.

At UiS since 2019. Gravitational waves.



Alexander Lehmann,
Ph.D. student.

At UiS since 2018. Lattice field theory and Hadron physics.



Gaurang Parkar,
Ph.D. student.

At UiS since 2019. Lattice QCD, Non-equilibrium field theory.

NTNU, Trondheim



Jens Oluf Andersen,
Professor.

At NTNU since 2005. QCD at finite temperature and density: Quark-gluon plasma, finite-density QCD and quark matter, phase transitions.



Michael Kachelriess,
Professor.

At NTNU since 2005. High energy astrophysics, dark matter, neutrino physics.



Marius Solberg,
Associate Professor.

At NTNU since 2016. Works on N-Higgs doublet models, quantum field theory, particle phenomenology.



Foteini Oikonomou,
Associate Professor.

At NTNU since 2020. Cosmic Rays, Multi-messenger astrophysics.



Prabal Adhikari,
Associate Professor.

At NTNU since 2019. QCD in extreme conditions.



Magdalena Eriksson,
Ph.D. student.

At NTNU/UiS since 2019. Quantum fields in cosmology.



Jonas Tjemsland,
Ph.D. student.

At NTNU since 2019. High energy astrophysics, cosmic antimatter.

HVL, Vestlandet



**Odd Magne Øgreid,
Associate Professor.**

At HVL since 1999. Works on particle phenomenology, extended Higgs sector, CP-violation.

HiØ, Østlandet



**Mikjel Thorsrud,
Associate Professor.**

At HiØ since 2014. General relativity, cosmology.

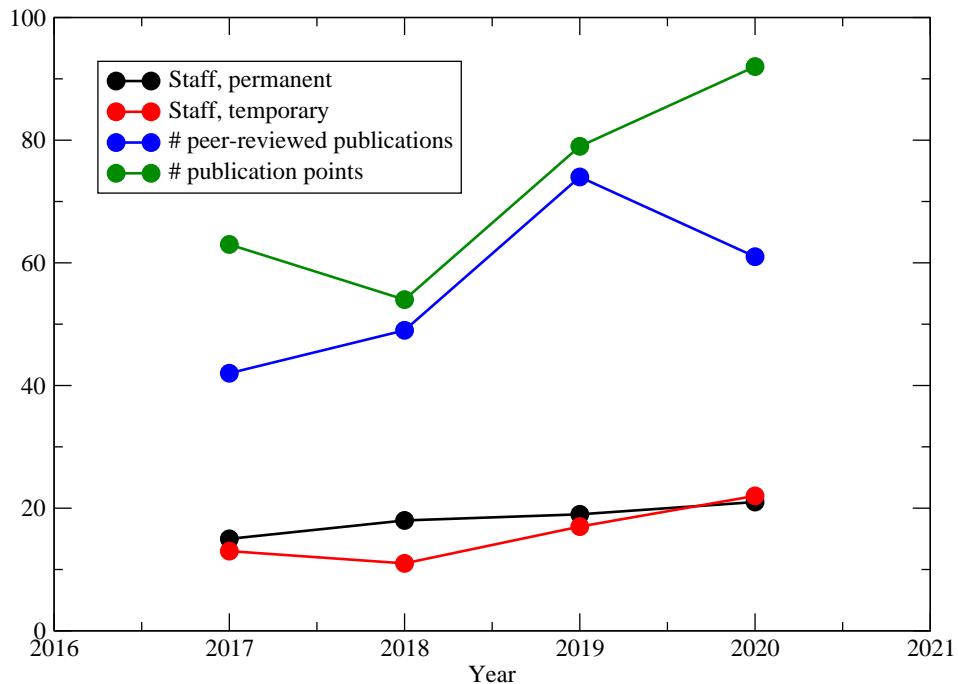


Figure 2: Members (senior and junior), number of publications and publication points over time.

Combined publication list

Metrics:

- 61 peer reviewed journal publications, published during 2020.
- 92 publication points, using new formula,

$$\sum \left[\sqrt{\frac{\text{Authors/affiliations in NPACT}}{\text{All authors/affiliations}}} \times \text{If International} \times \text{Publication level score} \right]$$

where: *If International* is 1 if all authors are Norwegian, 1.3 otherwise; *Publication level score* is either 1 or 3, depending on the journal; *Authors/affiliations* count author/affiliation

combinations (a single author with two affiliations counts twice); and where *All authors/affiliations* for a single publication is capped at 10 (for instance for GAMBIT).

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