

Theoretical Physics

Staff (2024):

- Program professor (PAP): Maxim Zabzine
- Faculty members: Ulf Danielsson, Joseph Minahan, Agnese Bissi (20%), Guido Festuccia, Lisa Freyhult, Henrik Johansson, Magdalena Larfors, Pietro Longhi, Oliver Schlotterer, Dmytro Volin
- Ph.D. students: 5 (6 graduated 2024)
- Postdocs: 11
- Researchers: 1 (present: Marco Chiodaroli)



Research focus

The program conducts research in theoretical physics, centering on fundamental questions in quantum field theory, string theory and mathematical physics.

Main Research Areas		% of program	FTE Faculty	Type
1	Theoretical and Mathematical Physics	100%	11	Basic
2				
3				
4				

KoF24 report, Table 3.1



Key enablers for research

- External funding for basic science
 - Excellence funding during evaluation: 3 ERCs, 3 Wallenberg program grants, 2 Wallenberg fellows, 4 VRs, 1 VR Starting grant, 1 VR Center for Excellence, Engkvist and Söderberg Foundations (ERC equivalent)
 - Concern: Limits on overhead have to be covered by faculty funding
- Creation of new subfields in quantum field theory
 - Internationally recognized advances in scattering amplitudes, integrability in gauge theories, supersymmetric QFTs, conformal bootstrap, string phenomenology and cosmology, and applications of AI tools in string compactifications.
- Synergy with the Department of Mathematics
 - The new VR Center for Excellence, The Center for Geometry and Physics, has created a strong research environment between the theoretical physics group and mathematicians.



Program priorities

(KoF24 report summary, Chapters 8-10)

Prio 1 (program): Survival of Theoretical Physics program

Survive in the long run and keep excellent young researchers in the group.

Prio 2 (department): More uniform research salary support for faculty members

Strengthen existing research by providing more stable support for research for all faculty members in department.

Prio 3 (faculty): Center for Geometry and Physics

Strengthen the Center for Geometry and Physics with regular positions and widen the area of mathematical physics at UU.

Merged into a joint priority for the departments of Mathematics and Physics & Astronomy

