Contribution ID: **9** Type: **not specified**

Tachyonic Instability and Dynamics of Spontaneous Symmetry Breaking

Project sketch:
In the very early universe, the Higgs could have existed in some unstable regime due to quantum fluctuations during a period of high scale inflation.
The project of this internship will be to study tachyonic instabilities and dynamics of spontaneous symmetry breaking in general, for an arbitrary scalar field, not necessarily the Higgs. This branches to many interesting physics aspects of the scalar field dynamics. One implication is preheating at the end of cosmological inflation and possible observational signatures in gravitational waves. Another distinct aspect is the dynamics of the Higgs at the electroweak phase transition, well after inflation, inside the radiation era, with baryogenesis as an application.

Rough fraction of physics/software work that is expected:
Both analytical work and some numerical calculations using Mathematica/Python.

Field

B5: Theory of Elementary Particles

DESY Place

Hamburg

DESY Division

FH

DESY Group

Theory

Special Qualifications:

basic knowledge in quantum field theory, particle physics and cosmology

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