

# PHYSICS AND ASTRONOMY COLLOQUIUM

## Dr. Steinar Stapnes

CERN & the University of Oslo

# “CLIC - A Linear Collider at CERN Exploring the Terascale”

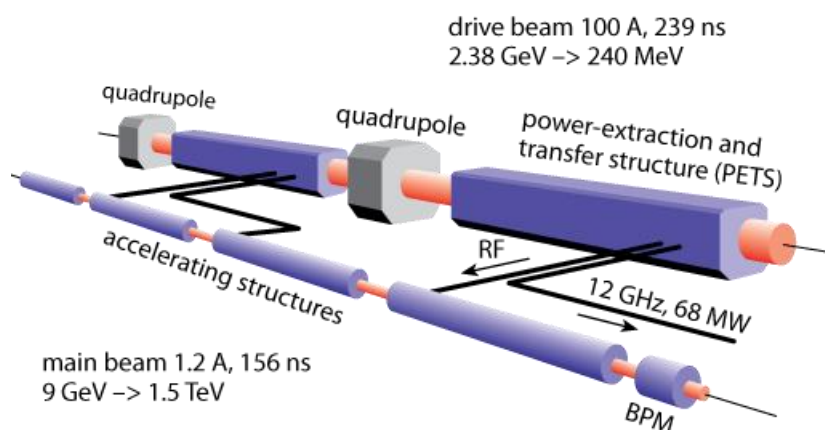
### Abstract

The Compact Linear Collider study (CLIC) is a collaboration based accelerator project with the aim of developing the design, key technologies and implementation plans for a multi-TeV linear electron-positron collider. Around 50 groups from 25 countries are involved, with CERN acting as central laboratory and host of the studies.

The CLIC concept is based on high gradient normal-conducting accelerating structures. CLIC utilizes a novel two-beam-acceleration concept for production of 12 GHz RF-power for the structures. The power is generated by a high current electron beam - drive beam - running parallel to the main beam. In order to establish the feasibility of this concept a number of key issues have been successfully addressed. A short summary of the progress and status of the corresponding studies will be presented, high-lighting the challenges involved in constructing such a machine. Some keywords are acceleration gradients, two-beam acceleration, small beam sizes, stability and experimental conditions.

Comprehensive physics and detector studies are carried out in parallel with the accelerator-studies, also structured as a collaborative effort involving more than 15 groups. The detector developments are also challenging and ambitious, aiming for very low mass and highly granular detector-systems. Some examples of these studies will be included.

Recent implementation studies for CLIC have converged towards a staged approach providing a possibility for a unique several decade long physics programme exploring the energy frontier as well as covering Higgs precision physics, complementing and going beyond the LHC programme and capabilities in several areas. The machine is therefore considered an option for a post-LHC facility at CERN. The development work towards an Implementation Plan by 2016-17, aimed at presenting a project that can be ready for initial endorsement when LHC data at full energy is available and can be ready as a first stage project around 2030, will be outlined. The future programme offers many possibilities for accelerator and detector R&D for the participating universities and laboratories, with a wide general relevance also outside CLIC.



Wednesday, April 03, 2013

3:30 p.m.

Bob Wright Centre

Room A104