

SUMMER STUDENT LECTURE PROGRAMME 2022

Lecture Title

Theoretical Concepts in Particle Physics

Lecturer's name

Tim Cohen

E-mail Address

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Short CV

- CERN Staff: 2022 - present
- EPFL Staff: 2022 - present
- University of Oregon Associate Professor: 2020 - present
- University of Oregon Assistant Professor: 2015 - 2020
- Princeton Institute for Advanced Study Member: 2014 - 2015
- Princeton University Postdoc: 2014 - 2015
- SLAC National Accelerator Laboratory Postdoc: 2011 - 2014
- University of Michigan Graduate Student: 2006 - 2011
- University of Alabama Huntsville Undergraduate Student: 2002 - 2006

Lecture Content

We will cover a variety of topics in theoretical particle physics. We will discuss the role of various mathematical concepts appear in particle physics such as group theory and complex analysis. We will discuss the modern approach to special relativity through the lens of group theory. We will discuss the ideas of effective field theory with an emphasis on the role of dimensional analysis and Taylor expansions.

Pre-requisites:
earlier series of lectures
that the students
should follow

The Particle World lectures by David Tong should be quite relevant.

Other pre-requisites:

Experience with calculus, group theory, and complex analysis would all be very helpful.