

## **abstract**

MINI-COURSE

Topic:

Speaker:

Affiliation:

Date:

Time/Room:

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There has been quite a lot of recent work in additive combinatorics seeking to develop our understanding of the 'higher Fourier analysis' suggested by the work of Gowers on Szemerédi's theorem and the work of various ergodic theorists (Host, Kra, Ziegler) on non-conventional averages. It seems that the so-called nilsequences are the 'right' generalization of the familiar exponentials  $e^{2\pi i t n}$  appearing in harmonic analysis.

In these lectures we will explain what a nilsequence is, and why these objects are important in additive combinatorics. We will also discuss some recent joint work with T. Tao on the structure of an arbitrary nilsequence, and indicate some of its applications.