

Univerzita Karlova
Matematicko-fyzikální fakulta

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Jarníkovskou přednášku

Fourier Transform in the 21st Century

kterou přednese

Prof. Dr. Hans Georg Feichtinger

(University of Vienna, Austria)

**ve středu dne 4. října 2017
ve 14.00 hod.**

v posluchárně V. Jarníka (M1),
děkanát MFF UK, 2. patro
Ke Karlovu 3, Praha 2

Abstract: The Fourier transform is close to 200 years old by now, but the method of teaching has not much changed in the last 100 years, once Lebesgue integration was established. But the range of applications has dramatically changed in the last 50 years. Digital signal processing is largely based on the FFT (the Fast Fourier transform, as proposed in 1965 by Cooley-Tuckey), while the theory of tempered distributions as proposed a bit earlier by L. Schwartz is the basis of the modern theory of partial differential equations. The talk will outline some of the connections from linear algebra to Fourier analysis that can easily be explained using numerical experiments and guide towards basic facts of what is called time-frequency or Gabor analysis. Here local frequency analysis is performed in a rather classical sense. Based on these investigations a new setting, the so-called Banach Gelfand triple $(SO, L2, SO')$ is proposed, which allows to describe the Fourier transform in a unified way, essentially viewing it as the linear mapping which maps pure frequencies into Dirac measures. In this setting even a kernel-theorem is possible, which is the analogue of a matrix representation for linear mappings in the finite dimensional case.

Hans Georg Feichtinger was born on 16 June, 1951, in Wiener Neustadt, Austria. He studied mathematics and physics at the University of Vienna, finishing with the PhD in 1974. He received his habilitation in 1979 at the same university and was teaching there until summer 2015. He is the founder of the Numerical Harmonic Analysis Group (NuHAG) in Vienna which has realized approximately 10 Marie Curie Fellowships and one Marie Curie Excellence Grant. H.G. Feichtinger is mainly interested in harmonic analysis with particular focus on time-frequency analysis. He supervised 31 finished PhD students, several of them currently holding positions at ETZ Zürich, DTU Copenhagen, TU München, and RWTH Aachen. He is Editor in Chief of the Journal of Fourier Analysis and Applications. He has held visiting positions in Heidelberg, College Park, Storrs/CT, Edinburgh, New Zealand, and more recently Marseille (Morlet Chair), ETH Zürich, DTU Copenhagen and TU München. He published more than 100 scientific papers. His work was cited more than 2000 times by more than 650 authors.