COLLOQUIUM

Il giorno Mercoledì 22 Novembre 2023, alle ore 13:15, in Aula7D, il

Prof. **Franz LUEF**

della Norwegian University of Science and Technology (NTNU)

terrà una conferenza dal titolo

From time-frequency analysis to quantum harmonic analysis

Abstract. Time-frequency analysis provides tools to capture the time and frequency content of a function such as the Wigner transform or the spectrogram. These time-frequency representations are used in signal analysis, acoustics, wireless communication and many other areas of mathematics and physics. Quantum harmonic analysis is in some sense Fourier analysis for operators, where one has at one's disposal two types of convolutions, one between two operators and one between a function and an operator, and a Fourier transform for operators, known as the Fourier-Wigner transform.

We will see that time-frequency analysis fits naturally into the framework of quantum harmonic analysis and that all the basic results from harmonic analysis have counterparts for operators, such as the Riemann-Lebesgue lemma, the Plancherel theorem, the Hausdorff-Young theorem, Young's inequalities, Tauberian theorems etc. This will allow us to see uncertainty principles, Cohen class distributions, localization operators and quantization methods from a new perspective. In addition, we indicate how this might be used to detect local structures in data sets and how to compare two different data sets with each other.

Bio. Franz Luef is Full Professor of Analysis at the Norwegian University of Science and Technology in Trondheim, Norway. After receiving his doctoral degree in applied harmonic analysis from the University of Vienna he worked as a postdoc at the University of Vienna and at the University of California at Berkeley. His research interests are quite broad and include time-frequency analysis, pseudo-differential operators, noncommutative geometry and quantum harmonic analysis.

Alla conferenza seguirà un coffee break.