Geometi



## **Daniel Hauer**

University of Sydney

In this talk, I aim to characterize all distributional solutions of the generalized Helmholtz equation

$$f(-\Delta)u = f(k^2)u$$

on the Euclidean space  $\mathbb{R}^d$  for every real  $k \neq 0$  and a non-constant Berstein function f. Note, that  $f(-\Delta)$  is a non-local operator and the prototype would be the fractional operator  $(-\Delta)^s$  for 0 < s < 1. To attack this problem, we first need to introduce a notion of distributional solutions of the generalized Helmholtz equation. This involves showing that the negative Laplacian is non-negative on a Lizorkin space.

The results presented in this talk are obtained in joint work with Robert Denk (University of Konstanz, Germany) and David Lee (Laboratoire Jacques-Louis Lions, Paris, France).