Seminar of the Work Group
Nonlinear Partial Differential Equations
SS 22

Speaker: Dr. Francesco Fanelli
April 19th, 2022, 14:00 - 15:00
Seminar room: 3.061

WELL AND ILL-POSEDNESS ISSUES FOR SOME MODELS OF TURBULENCE

Francesco Fanelli

In this talk, we review some recent results about the so-called Kolmogorov two-equation model of
turbulence. This is a coupling of three degenerate parabolic equations for the mean velocity field $u$ of the
fluid, the mean frequency $\omega$ of the turbulent fluctuations and the average turbulent kinetic energy $k$.

We focus in particular on the case when the initial turbulent kinetic energy $k_0$ is allowed to vanish, in
space dimension $d = 1$. We show that, in this case, smooth local solutions exist, but in general they blow
up in finite time.

This is based on joint works with R. Granero-Belinchón (Universidad de Cantabria – Santander,
Spain).