Oberseminar
Analysis und Theoretische Physik

Prof. Dr. Mats Ehrnström (NTNU Trondheim)

On Whitham's conjecture of a highest cusped wave for a nonlocal dispersive equation

We consider the Whitham equation $u_t + 2u\,u_x + Lu_x = 0$, where L is the nonlocal Fourier multiplier operator given by the symbol $m(\xi) = \sqrt{\tanh \xi / \xi}$. G. B. Whitham conjectured that for this equation there would be a highest, cusped, travelling-wave solution. We find this wave as a limiting case at the end of the main bifurcation curve of P-periodic solutions, and give several qualitative properties of it, including its optimal $C^{1/2}$-regularity. An essential part of the proof consists in an analysis of the integral kernel corresponding to the symbol $m(\xi)$, and a following study of the highest wave. In particular, we show that the integral kernel corresponding to the symbol $m(\xi)$ is completely monotone, and provide an explicit representation formula for it.

Dienstag, 02. Februar 2016, 15:00 Uhr, Raum c311
Hauptgebäude der Universität

Über Ihren Besuch würden sich freuen: **Prof. Dr. Wolfram Bauer**
Prof. Dr. Joachim Escher
Prof. Dr. Olaf Lechtenfeld
Prof. Dr. Elmar Schrohe
Prof. Dr. Christoph Walker