Recent progress on mathematical wave turbulence

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Abstract. The theory of wave turbulence, which started in the 1920s as the wave analog of Boltzmann’s kinetic theory, has been an active field of physics in the last century, with substantial applications in science. In this talk I will review some recent works, joint with Zaher Hani, that establish the rigorous mathematical foundation of this subject. In particular, we present the justification of the wave kinetic equation up to arbitrarily large kinetic time, which is the first long time result ever obtained in any nonlinear kinetic limit.