# A small window on wave turbulence theory

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Wave turbulence theory is a vast subject and its goal is to formulate a global picture of wave interactions. Phenomena involving interactions of waves happen at different scales and in different media: from gravitational waves to the waves on the surface of the ocean, from our milk and coffee in the morning to infinitesimal particles that behave like wave packets in quantum physics. These phenomena are difficult to study in a rigorous mathematical manner, but maybe because of this challenge mathematicians have developed interdisciplinary approaches that are powerful and beautiful. I will describe some of these approaches and show for example how the need to understand certain multilinear and periodic interactions gave also the tools to prove a famous conjecture in number theory, or how classical tools in probability gave the right framework to still have viable theories behind certain deterministic counterexamples.

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