

Title: Wave Turbulence and Pattern Formation  
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Abstract: Wave turbulence addresses the long time behavior of a sea of random waves after a storm. One would like to know what the long-time nature of the spectrum is or, equivalently, after a long time, how much energy there is in waves of 100-meter length, 10-meter length, centimeter length and so on. Amazingly, there is a closed Boltzmann equation for the distribution. But there are also many challenges.

Pattern formation (think of your fingerprints) is an area which begs one to think that there should be a description not of the small-scale details but for the large-scale structures. I will show you that such challenges arise in many areas from elasticity to fluid convection to phyllotaxis and discuss some open challenges.