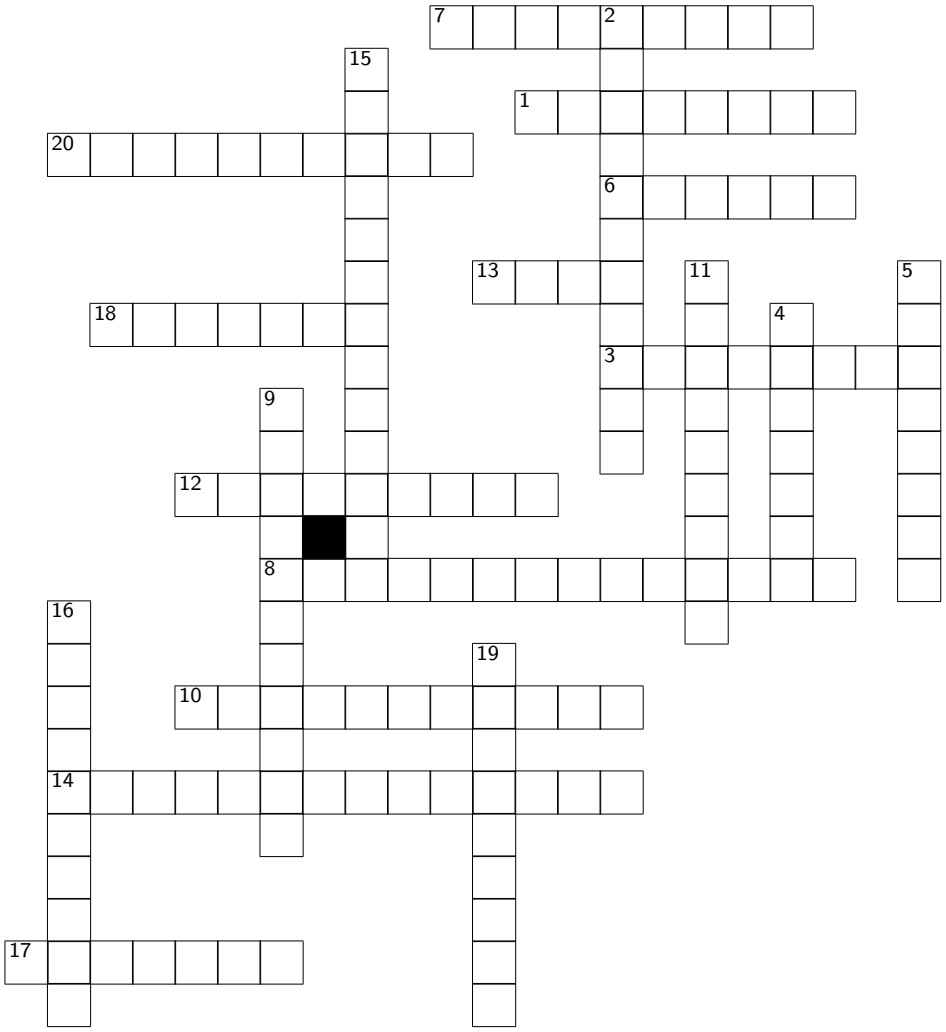
Scattering and diffraction of acoustic waves in three problems with broken symmetry



Across

1 “the existence of different viewpoints from which the system appears the same”
3 uniformity of a system in different directions
6 Soviet physicist who calculated acoustic radiation force on subwavelength spheres
7 German physicist after whom the operator $\nabla^2 + k^2$ is named, where k is the wavenumber
8 The density of an _____ medium does not vary time, precluding the existence of acoustic waves.
10 At high frequencies, wavefronts are _____, meaning they resemble plane waves.
12 This is the order of the wave variable at which radiation force is studied.
13 German-British physicist after whom the weak-scattering approximation is named; Oppenheimer’s advisor
14 Acoustic _____ is denoted by the Greek letter α and describes a scatterer at low frequencies.
17 A _____ medium does not supply external acoustic or electromagnetic energy.
18 The _____ number ℓ, sometimes referred to as the topological charge, describes the helicity of a vortex beam.
20 American physicist associated with the far-field surface integral for radiation force

Down

2 uniformity of a system at different positions
4 French physicist who studied the diffraction of light from circular apertures
5 British physicist who explained why the sky is blue
9 The _____ approximation, also called the low-frequency approximation, assumes that the acoustic wavelength is much larger than the length scale of interest.
11 _____ acoustics is an infinite-frequency approximation in which sound waves are modeled as rays.
15 _____ crystals generate an electric field when squeezed.
16 In a _____ medium, changing the position of the source and observer has no effect on the measured fields.
19 The symbol $\nabla_\perp^2$ is the transverse _____, given in Cartesian coordinates by $\partial^2/\partial x^2 + \partial^2/\partial y^2$.