Interplay between hyperbolic and dispersive equations

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Hyperbolic and dispersive partial differential equations are ubiquitous in fields as diverse as fluid dynamics, water waves, nonlinear optics, and quantum hydrodynamics. Dispersive perturbations of nonlinear hyperbolic equations admit nonlinear waves, especially periodic ones, which can be studied by modulation theory, leading to new, hyperbolic systems of conservation laws. Along the way, certain notions of integrability are preserved. However, the path can also be followed without integrability. For example, if one starts from the compressible Euler equations. We will see how this path works. No previous knowledge of PDE analysis is required.