Bandwidth extension for wave-based imaging
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This talk considers the basic question of frequency extrapolation of bandlimited recordings of scattered waves. I will review recent progress on the mathematical aspects of this question, which are tied to the notion of super-resolution. I will also discuss two methods that were shown to give meaningful results for seismic imaging: (i) a model reduction approach, where the phases of atomic seismic events are estimated by tracking, and (ii) a model extension approach, based on TV-regularized least-squares inversion of the extended Born modeling operator. Both methods are meaningful in the sense that they can help bootstrap the frequency sweeps for full waveform inversion. Joint work with Yunyue Elita Li.