**Extreme scale matrix factorizations in Exploration Seismology**
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We will present some recent work on matrix factorizations with applications that range from full-azimuth seismic data processing w/ coil acquisition to seismic data compression & recovery w/ on-the-fly data extraction, and low-rank representations of omnidirectional subsurface extended image volumes. In all cases, we demonstrate that seismic data and full-subsurface offset image volumes exhibit a low-rank structure at the low to medium high frequencies. This property allows us to come up with (randomized) algorithms capable of exploiting this structure while working with data and image volumes that were until recently unattainable.

This is joined work with Curt Da Silva, Marie Graff, Rajiv Kumar, and Yiming Zhang