Radio interferometry has grown up with applications involving a small number of instantaneous Fourier plane samples, small fields of view across which the sky is effectively flat, sparse sources of emission, and a fixed regular coordinate grid. A new generation of antenna arrays whose development is driven by cosmology and time domain astrophysics defies these norms. Telescopes such as the Large Aperture Experiment to Detect the Dark Age (LEDA) will collect a hundred thousand Fourier samples per frequency channel and polarization all at once, image virtually the entire (curved) sky instantaneously, and cope with time-variable ionospheric distortion of celestial signal propagation. I will discuss techniques of warped snapshot image synthesis and forward modeling, which enables deconvolution of instrument response absent damage to image statistics on scales of interest. These techniques can be very computationally and data intensive. End-to-end implementation of algorithms and pipelines with GPUs has been an effective tool in making the problem tractable. GPUs have also achieved high performance in calculation of raw Fourier sample data, which can involve cross-correlation of time-series signals from hundreds of inputs on time scales of tens of microseconds. These developments contribute substantively to the pursuit of facilities anticipated for later this decade, such as the Hydrogen Epoch of Reionization Array (HERA) and the Square Kilometer Array (SKA).