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Abstract for an Invited Paper
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The Very Early Universe: Origin of Space, Time and the Large Scale Structure

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Modern cosmology began almost a hundred years ago, with the advent of general relativity. Yet, for decades there was a great deal of controversy on basic questions such as the orgin of space, time and the of the large scale structure of the universe. Thanks to the spectacular observational advances since the 1990s, a 'standard model' of the early universe has now emerged. However, since it is based on quantum field theory in curved space-times, it is not applicable in the Planck era. Using techniques from loop quantum gravity, recently the theory was extended over the 12 orders of magnitude in density and curvature from the onset of inflation all the way back to the Planck regime. The new framework sharpens conceptual issues and has interesting lessons for both theory and observations. In the tradition of APS plenary talks, the talk will be addressed to non-experts.