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Simulating the First Water in the Universe

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It is now believed that as much as 50% of the solar systems water may have predated the Sun, suggesting an ancient heritage for this life-giving substance. This raises questions about the abundance of water throughout the universe, and touches on the question of the cosmic conditions in which this ingredient for the rise of life first appeared. In this talk, I will summarize efforts, now 4 years in the making and spanning 5 institutions, to create the first simulation of the rise of water in the early universe. We couple a fully implicit chemical reaction network, including 50 reactants and now 350 reactions, inline with an Eulerian cosmology code. Ill present state-of-the-art visualizations of our initial simulation results of water appearing in its first cosmological context in the very early universe and will discuss implications of our results.