A Multi-layer extension of the KPZ equation

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The Airy process describes the evolution of the largest eigenvalue of Hermitian Brownian motion, and extends to the so called multilayer Airy process which describes the kth largest eigenvalues for k=1,2,3,… On the other hand we know that the KPZ equation (starting from the wedge initial condition) is a positive temperature analogue of the largest eigenvalue, which converges to the Airy process for large times. Thus it is natural to construct an extension of the KPZ equation which captures the analogues of the other eigenvalues. I will describe such a construction, some tentative links with integrable systems, and some conjectures regarding it. This is based on joint work with Neil O'Connell.