The quantum K-theory of a homogeneous space $X$ is a deformation of the ordinary K-theory ring, where the structure constants are defined as polynomial expressions in K-theoretic Gromov-Witten invariants. In contrast to (ordinary) cohomological GW invariants, the K-theoretic invariants can be non-zero in arbitrarily high degrees. As a consequence, there might be infinitely many non-zero terms in the product of two Schubert classes. When $X$ is a Grassmannian of type A, a Pieri rule proved by Mihalcea and the speaker implies that all products are finite. I will speak about new work with Chaput, Mihalcea, and Perrin that shows that the quantum K-theory of $X$ is finite when $X$ is any cominuscule homogeneous space. (Received September 22, 2010)