# ALGEBRA AND GEOMETRY SEMINAR

The Hong Kong University of Science and Technology
Department of Mathematics

**Maximal products of symmetric double cosets in a compact Lie group**

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Consider the following problem: characterize pairs $x, y$ in a compact Lie group $G$ such that $KxK * KyK = G$, where $K$ is the fixed-point subgroup of an involutive automorphism of $G$. I'll explain how to derive a necessary condition on $x, y$ from combinatorial properties of the root system of $(G, K)$ and its affine Weyl group. In the cases where $G = \mathrm{SU}(n)$ and $K$ is the orthogonal group $\mathrm{O}(n)$, the compact symplectic group $\mathrm{Sp}(n/2)$, or the block-diagonal group $S(\mathrm{U}(n/2) \times \mathrm{U}(n/2))$, this necessary condition turns out to be sufficient, and I'll explain why quantum Schubert calculus comes into the proof of this statement. I'll also give some motivation from quantum computing for considering this problem. No background on quantum computing will be assumed.

Room 4503 (Lift 25/26) Wed, May 13, 2026 04:00 PM

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