**Groups and Representations I: Problem Set 1**

Due Monday, September 24

**Problem 1:** Prove that the classical compact groups $SO(n)$ and $SU(n)$ are compact and connected.

**Problem 2:** Show that $SU(n)/SU(n - 1) = S^{2n-1}$.

**Problem 3:** Show that $Sp(n)$, defined as $Sp(n, \mathbb{C}) \cap U(2n)$ is isomorphic to the subgroup of $GL(n, \mathbb{H})$ preserving the standard quaternionic norm.

**Problem 4:** Knapp, problem 7 of Introduction, page 21.

**Problem 5:** Knapp, problem 8 of Introduction, page 21.

**Problem 6:** Knapp, problem 9 of Introduction, page 21.