**Invariant holonomic systems for symmetric spaces.**

Fix a complex reductive Lie group $G$ with Lie algebra $\mathfrak{g}$ and let $V$ be a symmetric space over $\mathfrak{g}$ with ring of differential operators $\mathcal{D}(V)$. A fundamental class of $\mathcal{D}(V)$-modules consists of the *admissible modules* (these are natural analogues of highest weight $\mathfrak{g}$-modules). In this lecture I will describe the structure of some important admissible modules. In particular, when $V = \mathfrak{g}$ these results reduce to give Harish-Chandra's regularity theorem for $G$-equivariant eigendistributions and imply results of Hotta and Kashiwara on invariant holonomic systems. If I have time I will describe extensions of these results to the more general polar $\mathfrak{g}$-representations.

A key technique is relate (the admissible module over) invariant differential operators $\mathcal{D}(V)^G$ on $V$ to (highest weight modules over) Cherednik algebras.

This research is joint with Bellamy, Levasseur and Nevins.