



## GLOBAL ANALYSIS SEMINAR

# Chern Moser Operators And Weighted Jet Determination Problems

Francine Meylan

University of Fribourg, Switzerland

**Abstract:** The Chern-Moser operator provides a powerful tool to understand local CR geometry of Levi nondegenerate manifolds. For instance, the celebrated Chern-Moser normal form construction essentially reduces to the analysis of its kernel and its image. It has been a long standing question whether these methods and techniques can be adapted and applied to Levi degenerate manifolds. On the other hand, the Levi degenerate case presents completely new challenges, which are closer to algebraic, rather than to differential geometry.

Starting with the work of Kohn, the study of Levi degenerate manifolds has led to major advances both in analysis and geometry, in particular in microlocal analysis, subelliptic multiplier ideal sheaves, or in the work of Baouendi, Rothschild and others.

In this talk, we recall the notion of Catlin multitype for a smooth hypersurface  $M \subset \mathbb{C}^{n+1}$ ,  $n \geq 1$ , and its basic properties. We also recall the notion of model hypersurface associated to  $M$  called  $M_H$ . As we will see, hypersurfaces of finite Catlin multitype provide the natural class for which a generalization of the Chern-Moser operator is “possible”.

We then introduce the notion of weighted jets and show how to reduce the study of the weighted jet determination problem for  $\text{Aut}(M, p)$  the stability group of  $M$ , to the study of  $\text{hol}(M_H, p)$ , the set of real-analytic infinitesimal CR automorphisms of  $M_H$  at  $p$ .

We illustrate these techniques by describing completely  $\text{Aut}(M, p)$ , when  $M_H$ , the model hypersurface associated to  $M \subset \mathbb{C}^3$ , is of the form

$$\{z_1, z_2, w) \in \mathbb{C}^3 \mid \text{Im}w = z_1 \bar{z}_2^\ell + z_3^\ell \bar{z}_1, \ell > 1\}$$

This is a joint work with Martin Kolar.

Wednesday September 8, 1–2:20pm

Wachman Hall 617

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