



McMaster University



University of Toronto



University of Waterloo

## THE FIELDS INSTITUTE FOR RESEARCH IN MATHEMATICAL SCIENCES

### COLLOQUIUM IN DIFFERENTIAL EQUATIONS

#### SPEAKER:

**MAREK KOSSOWSKI**  
University of North Carolina

On the Topic:

#### "Fiber Completions, Contact Singularities, and Single Valued Solutions for $C^\infty$ -Second Order ODE"

Given a second order ODE,  $R(x, y, y', y'') = 0$ , we seek local real solutions  $y = f(x)$  which fail to be smooth at an isolated point where they are  $C^0$  and  $(f'(x))^{-m}$  has a zero of order  $n$  for some  $0 < n, m \in \mathbb{Z}$ . This is accomplished by observing that the 2-jet space  $J^2(\mathbb{R}, \mathbb{R})$  has a natural completion  $G^2(\mathbb{R}^2)$ . The existence of such solution requires that the ODE, viewed as a 3-variety in  $J^2(\mathbb{R}, \mathbb{R})$ , have a completion in  $G^2(\mathbb{R}^2)$ . We then establish local normal forms for such ODE up to contact transformations.

**Wednesday, March 31, 1993**

**3:30 pm, room 3018**

at

**The Fields Institute**