

**The Eleventh Annual North/South Dialogue and
Alberta College Mathematics Conference
Mount Royal University, Calgary, Alberta,
May 6, 2011**

Time & Room	Speaker(s)	Title	Abstract/Description
8:30 am – 9:00 am EA 1014	REGISTRATION AND EARLY MORNING COFFEE BREAK – BEVERAGES AND SOME BAKERY ITEMS PROVIDED		
9:00 am – 9:15 am EA 1031	Bryan Lane, Dean, Faculty of Science and Technology, Mount Royal University	Greetings from the University and Organizers	
Session facilitator: Petr Zizler			
9:20 am – 9:50 am EA 1024	Ion Bica, Grant MacEwan University	Oscillatory Solutions For Sine- Gordon Equation	The Sine-Gordon equation, $u_{tt} - u_{xx} + \sin u = 0$, has a N -soliton solution formula which describes the interaction of an arbitrary number N of solitons. In this presentation I show how from the 2-soliton solution of the Sine-Gordon equation I create a new solution of this equation. The new solution is oscillatory, but singular.
9:55 am – 10:25 am EA 1024	A. Swishchuk University of Calgary	Levy Processes: History, Ideas, Applications	The talk is devoted to the beautiful class of stochastic processes, namely, Levy processes, that have rich history (I'll talk about it), full of wonderful ideas (I'll explain them) and have tremendous applications, including finance, number theory, relativistic theory (I'll present them) and many others.

10:30 am –11:00 am EA 1024	Xinwei Yu University of Alberta	On the well-posedness of the generalized Navier-Stokes equations in critical spaces.	The generalized Navier-Stokes equations (generalized NSE) are generalizations of the 3D incompressible Navier-Stokes equations (NSE), with the Laplacian replaced by its fractional powers. The generalized NSE shares many properties with the NSE. In 2008, Bourgain and Pavlovic proved that the NSE is ill-posed in its largest critical space. Interestingly, this particular property does not hold for the generalized NSE. In this talk I will review well-posedness results for the NSE/generalized NSE, and sketch the proof of well-posedness for the generalized NSE. This is joint work with Dr. Zhichun Zhai.
11:00am–12:00noon FACULTY CENTER	Lunch		
Session facilitator: Roberta LaHaye			
12:00noon–12:30pm. EA 1024	Brady Killough Mount Royal University	Trace Asymptotics for C^* -Algebras Associated to Smale Spaces	We consider the class of hyperbolic dynamical systems known as Smale spaces. Two key features of a Smale space are the existence of local canonical coordinates on which the dynamics are either expanding or contracting, and the existence of a unique entropy-maximizing invariant probability measure (the Bowen measure). The canonical coordinates give rise to equivalence relations, which in turn yield C^* -algebras (via a construction originally due to Ruelle), and integration against the Bowen measure yields traces on these algebras. There is also a natural way to represent these algebras faithfully as operators on $l_2(\mathbb{N})$, in which case the usual trace as an operator can be computed. We present an asymptotic result that relates these two seemingly unrelated traces. This is joint work with Ian Putnam.
12:35 am – 1:05 pm EA 1024	Bill Hackborn Augustana Campus, University of Alberta	Projectiles with Linear Resistance in Newton's <i>Principia</i>	Although the contents of Books I and III of Newton's <i>Principia</i> are widely known to physicists, mathematicians and others, fewer scholars are aware of the material in Book II, which deals largely with

	Camrose, Alberta		the motion of bodies through resisting mediums. This talk will look closely at Section I of Book II in which Newton describes via four propositions (with related lemmas and corollaries) the motion of a projectile through a medium whose resistance is proportional to the projectile's velocity. This section, while its contents are simpler mathematically than some other sections of Book II (notably Section II, which analyzes motion subject to resistance varying as the velocity squared), provides a nice example of how Newton uses proportionality and his infinitesimal calculus to represent physical quantities as indefinite lines and areas. It also seems that Newton makes an error in the third corollary of Proposition 4 when he attempts to relate the initial velocity of the projectile to the scaling of the diagram describing its trajectory.
1:10 pm – 1: 40 pm EA 1024	Axel Pavillet, Keyano College	The orthocentric tetrahedron of a triangle	The talk deals with plane and solid geometry. We show that we can easily link an orthocentric tetrahedron to any scalene triangle and we give some properties of its altitudes. It can be used to prove a little known triangle geometry theorem. A relationship with Voronoi's diagram of circles will also be shown
1:45 pm – 2:15 pm EA 1024	Tim Trudgian University of Lethbridge	Teaching Classes in 3 Countries; Managing Grief in 5 Stages.	Teaching techniques that are developed under one curriculum are often incompatible with another. There is some consternation that our experience from one institution is not adequate preparation for the next. I will talk about my own attempts at trying to manage the 'grief' that is encountered in teaching in different environments.
2:15 pm – 2:30 pm EA 1014	Coffee Break		
<u>Session facilitator: Brady Killough</u>			
2:30 pm – 3:00 pm	Adriana Dawes		

EA 1031	University of Alberta		
3:05 pm – 3: 35 pm EA 1031	Wiley Book Representative	WileyFLEX - Flexible Options for Students and Instructors.	With today's ever-changing student needs and instructor desires to customize course materials Wiley has created WileyFLEX. Flexible pricing and flexible formats.
3:40 pm – 4: 40 pm EA 1024	Panel Discussion: Undergraduate Research <u>facilitator: Peter Zizler</u>		