



Banff International Research Station

for Mathematical Innovation and Discovery

Trends in Applied Harmonic Analysis

September 24 -- 28, 2007

MEALS

*Breakfast (Buffet): 7:00 – 9:00 am, Sally Borden Building, Monday – Friday

*Lunch (Buffet): 11:30 am – 1:30 pm, Sally Borden Building, Monday – Friday

*Dinner (Buffet): 5:30 – 7:30 pm, Sally Borden Building, Sunday – Thursday

Coffee Breaks: As per daily schedule, 2nd floor lounge, Corbett Hall

*Please remember to scan your meal card at the host/hostess station in the dining room for each meal.

MEETING ROOMS

All lectures will be held in Max Bell 159 (Max Bell Building accessible by bridge on 2nd floor of Corbett Hall). Hours: 6 am – 12 midnight. LCD projector, overhead projectors and blackboards are available for presentations. Please note that the meeting space designated for BIRS is the lower level of Max Bell, Rooms 155-159. Please respect that all other space has been contracted to other Banff Centre guests, including any Food and Beverage in those areas.

SCHEDULE

Sunday (September 23)

- 16:00 Check-in begins (Front Desk – Professional Development Centre - open 24 hours)
Lecture rooms available after 16:00
17:30-19:30 Buffet Dinner, Donald Cameron Hall
20:00 Informal gathering in 2nd floor lounge, Corbett Hall
Beverages and small assortment of snacks available on a cash honour-system.

Monday (September 24)

- 7:00 - 8:30 Breakfast
8:30 - 8:40 Introduction and Welcome to BIRS by BIRS Station Manager, Max Bell 159

Session 1 (Diffusion PDE's for data-dependent filtering) Chairman: R. Q. Jia

- 8:40 - 9:10 C. K. Chui: Diffusion PDE's derived from bilateral filtering: An overview
9:10 - 9:40 J. Z. Wang: Diffusion PDE's derived from bilateral filtering: Proof of Results
9:40 - 10:10 G. Plonka: A digital diffusion-reaction type filter for nonlinear denoising

10:10-10:30 Coffee Break, 2nd floor lounge, Corbett Hall

Session 2 (Advances in theoretical development) Chairman: S. Dubuc

- 10:30-11:00 J. F. Geronimo: Stable polynomials, Christoffel-Darboux formula and applications
11:00-11:30 S.L. Lee: Mean Value Representation and Curvatures of Compact Convex Sets

11:30-13:00 Lunch

13:00-13:50 Guided Tour of The Banff Centre; meet in the 2nd floor lounge, Corbett Hall

13:50-14:00 Group Photo; meet on the front steps of Corbett Hall

Session 3 (Wavelet methods for image processing) Chairman: J. Stoeckler

14:00-14:30 Z. W. Shen: A Unified Tight Frame Approach for Missing Data Recovery in Images
14:30-15:00 S. L. Shen: Restoration of Chopped and Nodded Images by Framelets
15:00-15:30 H. Q. Zhao: Discrete Wavelets on Intervals and their Applications to Image Compression

15:30-16:00 Coffee Break, 2nd floor lounge, Corbett Hall

Session 4 (Learning algorithms and medical data analysis) Chairman: H. N. Mhaskar

16:00-16:30 D. X. Zhou: Learnability of Gaussians with Flexible Variances
16:30-17:00 Y. S. Xu: Kernels for Mathematical Learning Theory
17:00-17:30 D. Hong: Some Applications of Multiscale Tools in Medical Research

17:30-19:30 Dinner

Tuesday (September 25)

7:00-8:30 Breakfast

Session 5 (Mathematics of signal processing) Chairman: B. J. Lucier

8:40 - 9:10 S. D. Riemenschneider: Some aspects of time frequency representations
9:10 - 9:40 Q. Y. Sun: Sampling and reconstruction of signals with finite rate of innovation
9:40 -10:10 O. Yilmaz: The golden ratio encoder -
A new robust quantization algorithm for analog-to-digital conversion

10:10-10:30 Coffee Break, 2nd floor lounge, Corbett Hall

Session 6 (Polynomial frames) Chairman: J. F. Geronimo

10:30-11:00 H. N. Mhaskar: Diffusion polynomial frames on metric measure spaces
11:00-11:30 J. Prestin: Exponentially localized polynomial bases and frames

11:30-13:30 Lunch

Session 7 (Advances in mathematics of imaging) Chairman: Y. Wang

13:30-14:00 X. C. Tai: Using TV-Stokes equations for digital image denoising and restoration
14:00-14:30 H.M. Zou: Variational Models and PDE Techniques in Wavelet inpainting
14:30-15:00 L. Lieu: Diffusion Maps and Wasserstein Distance
15:00-15:30 X. Bresson: Fast Minimization of the Vectorial Total Variation Norm
and Applications to Color Image Processing

15:30-16:00 Coffee Break, 2nd floor lounge, Corbett Hall

Session 8 (Wavelet frames and applications) Chairman: Z. W. Shen

16:00-16:30 J. Stoeckler: Hilbert transform pairs of tight spline frames
16:30-17:00 M. Charina: Sibling frames for interpolatory subdivision
17:00-17:30 W. J. He: A Sufficient Condition for Existence of Vector-valued Tight Frames

17:30-19:30 Dinner

Wednesday (September 26)

7:00-8:30 Breakfast

Session 9 (PDE based numerical algorithms for image processing) Chairman: J. Prestin

8:40 - 9:10 B. J. Lucier: Some Numerical methods for the ROF model for BV image smoothing

9:10 - 9:40 Y. Wang: Multiscale Wavelet Total Variation Method for Image Denoising

9:40 -10:10 Q. S. Chang: A Robust Algorithm for Total Variation Deblurring and Denoising

10:10-10:30 Coffee Break, 2nd floor lounge, Corbett Hall

Session 10 (Wavelet and spline schemes) Chairman: D. X. Zhou

10:30-11:00 B. Han: Adaptive Wavelet Schemes for a Nonlinear Variational Problem

11:00-11:30 M. J. Lai: Approximation of functional regression models by bivariate splines

11:30-13:30 Lunch

Free Afternoon

17:30-19:30 Dinner

Thursday (September 27)

7:00-8:30 Breakfast

Session 11 (Wavelet bases and applications) Chairman: S. L. Lee

8:40 - 9:10 R. Q. Jia: The Projection Method in the Development of Wavelet Bases

9:10 - 9:40 S. Li: Riesz Sequences and Bases of Multiwavelets

9:40 -10:10 W. Zhao: A Wavelet Method for Numerical Solutions of Biharmonic Equations

10:10-10:30 Coffee Break, 2nd floor lounge, Corbett Hall

Session 12 (Subdivision schemes) Chairman: D. X. Zhou

10:30-11:00 S. Dubuc: De Rham Transform of Subdivision Schemes

11:00-11:30 G. Kutyniok: Shearlet Multiresolution Analysis and
Adaptive Directional Subdivision Schemes

11:30-13:30 Lunch

Session 13 (Algorithmic development and image processing) Chairman: M. J. Lai

13:30-14:00 K. Bittner: A prediction scheme for the adaptive approximation
of nonlinear functions of wavelet expansions

14:00-14:30 J.A. Lian: Families of Bivariate Refinable Scaling Functions

14:30-15:00 C. Dupuis: Analysis of a discrete, ill-posed, fourth order PDE from image processing

15:00-15:30 J. Darbon: TV Optimization and "Graph-cuts"

15:30-16:00 Coffee Break, 2nd floor lounge, Corbett Hall

Session 14 (Diffusion maps for high-dimensional scattered data analysis) Chairman: C. K. Chui

16:00-16:30 M. Maggioni: Harmonic Analysis on data sets

17:30-19:30 Dinner

Friday (September 28)

7:00-8:30 Breakfast

Session 15 Chairman: C. K. Chui

8:40-10:10 Informal Discussions

10:10-10:30 Coffee Break, 2nd floor lounge, Corbett Hall

11:30-13:30 Lunch

Checkout by 12 noon.

** 5-day workshops are welcome to use the BIRS facilities (2nd Floor Lounge, Max Bell Meeting Rooms, Reading Room) until 3 pm on Friday, although participants are still required to checkout of the guest rooms by 12 noon. **