

**Schedule for BIRS Workshop on Entropy Rate of Hidden Markov
Processes and Connections to Dynamical Systems**

Note: EACH LECTURE IS MAX OF 50 MINUTES + 10 MINUTES FOR
QUESTIONS.

Note: Meal times (from Sunday dinner through Friday lunch):

Breakfast 7:00 a.m. to 9:30 a.m.

Lunch 11:30 a.m. to 1:30 p.m.

Dinner 5:30 p.m. to 7:30 p.m.

Sunday, Sept. 30:

4 PM: check In at Banff Centre

7:30 - 9:30 PM: Informal reception, Corbett Hall, 2nd floor lounge

Monday, Oct 1:

9-9:15: Introductions

9:15-10:15: T. Weissman (EE, Stanford): Overview of entropy rate of HMP's.

10:15 - 10:45: Coffee

10:45 - 11:45: M. Boyle (Math, Maryland): Overview of Markovian maps

Lunch

1:00 - 2:00 (optional) tour of Banff Centre

2:00 - 2:15 Group photo

2:15 - 2:30: B. Marcus (Math, UBC), K. Petersen (Math, UNC): a very brief
history (in photos)

2:30 - 3:30: E. Verbitsky (Philips-Eindhoven): Thermodynamics of Hidden
Processes

3:30 - 4:00: Coffee

4:00 - 5:00: B. H. Juang (ECE, Georgia Tech): Hidden Markov Model and its Application in Speech Recognition – A Tutorial.

Tuesday, Oct 2:

9:00 - 10:00: E. Ugalde (Math, Universidad Autonoma de San Luis Potosi): On Gibbs measures and lumped Markov chains

10:00 - 10:30: Coffee

10:30 - 11:30: O. Zuk (Physics of Complex Systems, Weizmann Institute): HMP's Entropy Rate - Statistical Mechanics and Taylor Series Expansions

Lunch

1:30 - 2:30: A. Montanari (EE, Stanford): The rank of random band diagonal matrices in the Kac limit

2:30 - 3:30: E. Ordentlich (HP Labs - Palo Alto): Deterministic algorithms for computing/approximating the HMP entropy rate.

3:30 - 4:00: Coffee

4:00 - 5:00 P. Cuff (EE, Stanford): Entropy Rates of Hidden Markov Processes emerge from Blackwell's Trapdoor Channel

7:30 - 9:00 PM 1st Problem Session

Wednesday, Oct 3:

9:00 - 10:00: D. Guo (EECS, Northwestern): On The Entropy and Filtering of Hidden Markov Processes Observed Via Arbitrary Channels

10:00 - 10:30: Coffee

10:30 - 11:30: W. Slomczynski (Jagiellonian University): Entropy integral formula: from hidden Markov processes to quantum systems.

Afternoon: free, e.g., hike to Sulphur mountain

Thursday, Oct 4:

9:00 - 10:00: Y. Peres (Microsoft): Analyticity of Lyapunov exponents

10:00 - 10:30: Coffee

10:30 - 11:30: G. Han (Math, Hong Kong U.): Analyticity and Derivatives of entropy rate for HMP's

Lunch

1:30 - 2:30 H. Pfister (ECE, Texas A& M): The Derivatives of Entropy Rate and Capacity for Finite-State Channels

2:30 - 3:30 P. Vontobel (HP Labs - Palo Alto): Optimizing Information Rate Bounds for Channels with Memory

3:30 - 4:00 Coffee

4:00 - 5:00 P. Jacquet (INRIA): Entropy of HMP and asymptotics of noisy input-constrained channel capacity

7:30 - 9:00 PM 2nd Problem Session

Friday, Oct 5:

9:00 - 10:00: A. Kavcic (ECE, Hawaii): Markov and hidden Markov Processes in communication channels used with feedback

10:00 - 10:15: Coffee

10:15 - 11:15: M. Pollicott (Math, Warwick): Computing integrals, Lyapunov exponents and entropy using cycle expansions

12:00 Check Out of Banff Centre