Sunday, July 12. 5pm-8pm.

Opening Registration and Reception. Lobby of the Niagara Falls Conference Center.

Monday, July 13

8:00am--9:00am. (Room: **Foyer**) Breakfast at the Niagara Falls conference center.

9:00am--10:00am. (Room: **Cascade I**) Keynote Speech.

Eva Tardos (Cornell University)

Title: Games in Networks: the price of anarchy and learning

Abstract: Network games play a fundamental role in understanding behavior in many domains, ranging from communication networks through markets to social networks. Such networks are used, and also evolve due to selfish behavior of the users and owners. In light of these competing forces, it is surprising how efficient these networks are. It is an exciting challenge to understand the operation and success of these networks in game theoretic terms: what principles of interaction lead selfish participants to form such efficient networks?

We will focus on congestion games, and study the degradation of quality of solution caused by the selfish behavior of users. We model users as learning algorithms, and show that natural learning behavior can avoid bad outcomes predicted by the price of anarchy in atomic congestion games such as the load balancing game. We use tools from the theory of dynamical systems and algebraic geometry to show when players use a class of natural learning algorithms the distribution of play converges to the set of weakly stable equilibria, and that the set of weakly stable equilibria are the pure Nash equilibria with probability 1 when congestion costs are selected at random independently on each edge (from any monotonically parameterized distribution).

10:30am--12:00pm

TS1: Algorithmic Game Theory and Coding Theory Room: **Governer's** Session Chair: Hung Q. Ngo	TS2: Algorithms and Data Structures Room: **Red Jacket** Session Chair: Bethany M.Y. Chan
On the performances of Nash Equilibria in Isolation Games Vittorio Bilo', Michele Flammini, Gianpiero Monaco and Luca Moscardelli.	**Algorithm for Finding k-Vertex Out-trees and its Application to k-Internal Out-branching Problem** Nathann Cohen, Fedor Fomin, Gregory Gutin, Eun Jung Kim, Saket Saurabh and Anders Yeo.
An Attacker-Defender Game for Honeynets Jin-Yi Cai, Vinod Yegneswaran, Chris Alfeld and Paul Barford.	**A (4n -4)-bit representation of a rectangular drawing or floorplan** Toshihiko Takahashi, Ryo Fujimaki and Youhei Inoue.
Limits to List Decoding Random Codes Atri Rudra.	**Relationship between Approximability and Request Structures in the Minimum Certificate Dispersal Problem** Tomoko Izumi, Taisuke Izumi, Hirotaka Ono and Koichi Wada.

12:00pm--1:30pm. (Room: **Cataract**) Lunch Buffet

1:30pm--3:00pm	
TS3: Graph Drawing Room: **Governer's** Session Chair: Jinhui Xu	**TS4: Algorithms and Data Structures** Room: **Red Jacket** Session Chair: Philipp Woelfel
Coordinate Assignment for Cyclic Level Graphs Christian Bachmaier, Franz Josef Brandenburg, Wolfgang Brunner and Raymund Fülöp.	Efficient Data Structures for the Orthogonal Range Successor Problem Chih-Chiang Yu, Wing-Kai Hon and Biing-Feng Wang.
Crossing-optimal acyclic HP-completion for outerplanar st-digraphs Tamara Mchedlidze and Antonios Symvonis.	Reconstruction of Interval Graphs Masashi Kiyomi, Toshiki Saitoh and Ryuhei Uehara.
Edge-intersection graphs of k-bend paths in grids Therese Biedl and Michal Stern.	A Fast Algorithm for Computing a Nearly Equitable Edge Coloring with Balanced Conditions Akiyoshi Shioura and Mutsunori Yagiura.

3:00pm--3:30pm. Coffee Break.

3:30pm--5:00pm	
TS5: Cryptography and Security Room: **Governer's** Session Chair: Sheng Zhong	**TS6: Algorithms** Room: **Red Jacket** Session Chair: Philipp Woelfel
Minimal Assumptions and Round Complexity for Concurrent Zero-Knowledge in the Bare Public-Key Model Giovanni Di Crescenzo.	On Smoothed Analysis of Quicksort and Hoare's Find Mahmoud Fouz, Manfred Kufleitner, Bodo Manthey and Nima Zeini Jahromi.
Efficient Non-Interactive Range Proof Tsz Hon Yuen, Qiong Huang, Yi Mu, Willy Susilo, Duncan S. Wong and Guomin Yang.	On an Online Traveling Repairman Problem with Flowtimes: Worst-Case and Average-Case Analysis Alexander Souza and Axel Simroth.
Approximation Algorithms for Key Management in Secure Multicast Agnes Chan, Rajmohan Rajaraman, Zhifeng Sun and Feng Zhu.	Three new algorithms for regular language enumeration Margareta Ackerman and Erkki Mäkinen.

Tuesday, July 14

9:00am--10:00am. (Room: **Cascade I**) Invited Plenary Talk

Venkat Guruswami (Carnegie Mellon University)

Title: Approximation resistance of ordering problems: Max Acyclic Subgraph and Ordering 3-CSPs

Abstract: Given a directed acyclic graph, it is easy to "topological sort" its vertices such that all directed edges go forward in the ordering. But what if there is some noise and the graph is only nearly acyclic, say 1% of the edges need to be reversed to make it acyclic. Simply picking a random ordering gets an expected fraction 1/2 of edges going forward, but it was not known if one could efficiently find an ordering of the vertices of such a graph with even 51% of forward edges.

We prove that finding such an ordering is hard. Specifically, for any constant $\varepsilon > 0$, given a directed graph G that has an acyclic subgraph consisting of a fraction $(1-\varepsilon)$ of its edges, finding an acyclic subgraph of G with more than $(1/2+\varepsilon)$ of its edges is Unique-Games hard. This immediately implies a super-constant factor inapproximability result for the Feedback Arc Set problem.

More generally, we prove that every ordering problem with constraints on the local ordering of subsets of up to 3 elements (such as the "Betweenness" problem which has constraints of the form "j is placed between i and k"), is approximation resistant: it is UG-hard to outperform the trivial approximation ratio achieved by a random ordering.

Based on joint works [G.-Manokaran-Raghavendra'08] and [Charikar-G.-Manokaran'09].

10:30am--12:00pm.

TS7: Computational Geometry Room: **Governer's** Session Chair: Jinhui Xu	TS8: Approximation Algorithms Room: **Red Jacket** Session Chair: Ken Regan
Convex Partitions with 2-Edge Connected Dual Graphs Marwan Al-Jubeh, Michael Hoffmann, Mashhood Ishaque, Diane Souvaine and Csaba Toth.	**Approximation Algorithms for a Network Design Problem** Binay Bhattacharya, Yuzhuang Hu and Qiaosheng Shi.
The Closest Pair Problem Under the Hamming Metric Kerui Min, Ming-Yang Kao and Hong Zhu.	**An FPTAS for the minimum total weighted tardiness problem with a fixed number of distinct due dates** George Karakostas, Stavros Kolliopoulos and Jing Wang.
Space-Efficient Multi-Dimensional Range Reporting Marek Karpinski and Yakov Nekrich.	**On the Hardness and Approximability of Planar Biconnectivity Augmentation** Carsten Gutwenger, Petra Mutzel and Bernd Zey.

12:00pm--2:00pm. Lunch break. (Attendees on their own.)

2:00pm--3:00pm		
TS9: Computational Biology and Bioinformatics Room: **Governer's** Session Chair: Bhaskar DasGupta	**TS10: Sampling and Learning** Room: **Red Jacket** Session Chair: Atri Rudra	**TS11: Algorithms** Room: **Whitney** Session Chair: Jinhui Xu
Determination of glycan structure from tandem mass spectra Sebastian Böcker, Birte Kehr and Florian Rasche.	**On the Diaconis-Gangolli Markov Chain for Sampling Contingency Tables with Cell-Bounded Entries** Ivona Bezakova, Nayantara Bhatnagar and Dana Randall.	**Online Tree Node Assignment with Resource Augmentation** Joseph Chan, Francis Chin, Hing-Fung Ting and Yong Zhang.
The Generalised Character Compatibility Problem for Non-Branching Character Trees Jan Manuch, Murray Patterson and Arvind Gupta.	**Finding a Level Ideal of a Poset** Shuji Kijima and Toshio Nemoto.	**Why Locally-Fair Maximal Flows in Client-Server Networks Perform Well** Kenneth Berman and Chad Yoshikawa.
3:00pm--3:30pm. Coffee Break		
3:30pm--5:00pm		
Inferring peptide composition from molecular formulas Anton Pervukhin and Sebastian Böcker.	**A polynomial-time perfect sampler for the Q-Ising with a vertex-independent noise** Masaki Yamamoto, Shuji Kijima and Yasuko Matsui.	**On finding small 2-generating sets.** Isabelle Fagnot, Guillaume Fertin and Stéphane Vialette.
Optimal Transition Selection for Targeted Protein Quantification Rastislav Sramek, Bernd Fischer, Elias Vicari and Peter Widmayer.	**Extracting Computational Entropy and Learning Noisy Linear Functions** Chia-Jung Lee, Chi-Jen Lu and Shi-Chun Tsai.	**Convex Recoloring Revisited: Complexity and Exact Algorithms** Iyad Kanj and Dieter Kratsch.
Computing Bond Types in Molecule Graphs Sebastian Böcker, Quang Bao Anh Bui, Patrick Seeber and Anke Truss.	**HITS can converge slowly, but not too slowly, in score and rank** Enoch Peserico and Luca Pretto.	**Strongly chordal and chordal bipartite graphs are sandwich monotone** Pinar Heggernes, Federico Mancini, Charis Papadopoulos and R. Sritharan.

6:30pm--8:00pm. (Room: **Cataract**) Conference banquet.

8:00am--9:00am. (Room: **Foyer**) Breakfast at the Niagara Falls conference center.

9:00:am--10:00am. (Room: **Cascade I**) Invited Plenary Talk

Muthu Muthukrishnan (Google Research)

Title: Bidding on Configurations in Internet Ad Auctions

Abstract: In Internet advertising, a configuration of ads is determined by the seller, and advertisers buy spaces in the configuration. In this paper, motivated by sponsored search ads, we propose an auction where advertisers directly bid and determine the eventual configuration.

10:30am--12:00pm

TS12: Complexity and Computability Room: **Governer's** Session Chair: Ken Regan	TS13: Probabilistic Analysis Room: **Red Jacket** Session Chair: Hung Q. Ngo
Hierarchies and Characterizations of Stateless Multicounter Machines Oscar Ibarra and Omer Egecioglu.	**Random Deployment of Wireless Sensor Networks: Power of Second Chance** Xiang-Yang Li, YaJun Wang and WangSeng Feng.
Efficient Universal Quantum Circuits Debajyoti Bera, Stephen Fenner, Steve Homer and Frederic Green.	**The Weighted Coupon Collector's Problem and Applications** Petra Berenbrink and Thomas Sauerwald.
An Improved Time-Space Lower Bound for Tautologies Scott Diehl, Dieter van Melkebeek and Ryan Williams.	**Sublinear-time Algorithms for Tournament Graphs** Lars Nagel, Stefan Dantchev and Tom Friedetzky.

12:00pm--1:30pm. Lunch Break (Attendees on Their Own)

1:30pm--3:00pm

TS14: Complexity and Computability Room: **Governer's** Session Chair: Ken Regan	TS15: Algorithms and Data Structures Room: **Red Jacket** Session chair: Atri Rudra
Classification of a Class of Counting Problems using Holographic Reductions Michael Kowalczyk.	**Popular Matchings: Structure and Algorithms** Eric J McDermid and Robert Irving..
Separating NE from Some Nonuniform Nondeterministic Complexity Classes Bin Fu, Angsheng Li and Liyu Zhang.	**Graph-Based Data Clustering with Overlaps** Michael Fellows, Jiong Guo, Christian Komusiewicz, Rolf Niedermeier and Johannes Uhlmann
On the Readability of Monotone Boolean Formulae Khaled Elbassioni, Kazuhisa Makino and Imran Rauf.	**Directional Geometric Routing on Mobile Ad Hoc Networks** Kazushige Sato and Takeshi Tokuyama.