

**19th Annual ACM Symposium on
Theory of Computing**
In cooperation with IEEE-Computer Society
May 25-27, 1987
Grand Hyatt Hotel
New York, NY

CONFERENCE INFORMATION

Location. Technical sessions are at the Grand Hyatt Hotel, on 42nd Street between Park and Lexington Avenues, adjacent to Grand Central Terminal and across the street from the East Side Airlines Terminal. Please make reservations directly with the hotel. Rates and availability not guaranteed after May 2, 1987.

Transportation. All participants of STOC 1987 are urged to use our official discount travel service, Direct Travel, Inc., (800-858-8228 and 212-302-7870). Every 40 American Airlines roundtrip air tickets booked through Direct Travel provides a student participant free transportation. Direct Travel will also fill your Amtrack needs. Participants should mention STOC 1987 when contacting Direct Travel. Major credit cards are preferred.

Local transportation. From Kennedy Airport, Carey Bus to Grand Central is \$8, Abbey's Airport Minibus to Grand Hyatt is \$11, and taxi is about \$26. From La Guardia Airport, Carey Bus to Grand Central is \$6, Abbey's Airport Minibus to Grand Hyatt is \$8.00, and taxi is about \$22. From Newark Airport, Olympia Trails to East Side Terminal is \$5, Airport Minibus to Grand Hyatt is \$15.75, and taxi is about \$26. From Penn Station, the subway to Grand Central is \$1.

Things to do. New York City is lovely in the spring time. Temperatures average in the mid-60's with a chance of refreshing showers. The city is one of the world's cultural centers: theater from Broadway musicals to off-Broadway dramas, music from classical to jazz, museums from modern art to American crafts, shopping from the Lower East Side to glamorous Fifth Avenue, restaurants from northern Italian cuisine to exotic Thai food, and sports from baseball to tennis. There is an abundance of interesting free/inexpensive activities: concerts in the parks, historic walking tours, bus rides through the City, visits to the Empire State Building or to the newly renovated South Street Seaport, and even tram rides over the East River.

Registration and Reception. Initial registration will be from 6-9 p.m., Sunday, May 24, outside of Ballrooms C&D. On Monday through Wednesday the registration desk will be located outside of Ballrooms C&D during the general sessions. There will be a reception on Sunday night from 8 to 11 in Ballrooms C&D.

ASL Spring Meeting. The 1987 Spring Meeting of the Association for Symbolic Logic (ASL) will be held May 23 - 24, 1987, at the Graduate School and University Center of CUNY, and the Courant Institute of Mathematical Sciences of NYU. Program information can be obtained from Prof. M. Davis, NYU - Courant Institute, 251 Mercer St., New York, NY 10012. A special session of invited addresses on topics of particular interest to STOC participants is being planned for Sunday afternoon.

UNIVERSITY SUPPORTERS

Brooklyn College - CUNY Brooklyn, NY 11210

Graduate School and University Center City University of New York New York, NY 10036

For Further Information. Contact the Conference Chair:

Prof. Dana May Latch, Dept. of CIS Brooklyn College - CUNY Brooklyn, NY 11210 (718) 780-5657, dml@cunyvms1.bitnet

Program Committee. A. Aho (chair), M. Blum, J. Halpern, R. Kannan, D. Kozen, A. LaPaugh, M. Luby, C. Papadimitriou, M. Sipser, F. Yao.

SIGACT Chair. Zvi Galil, Dept. of Computer Science, Columbia University, New York, NY 10027.

ADVANCE REGISTRATION FORM

Mail check payable in US dollars to ACM - STOC 87 before April 25, 1987 to:
STOC Registration
Prof. Dana May Latch
Dept. of CIS
Brooklyn College of CUNY
Brooklyn, NY 11210

	Before 4/25	After 4/25
Member ACM, SIGACT, or IEEE-CS	\$185 _____	\$235 _____
Non-member	\$215 _____	\$265 _____
Student (no lunches)	\$50 _____	\$80 _____
Authors/program committee	\$175 _____	\$235 _____

One copy of the proceedings is included in the fee.

Extra lunches @ \$35/meal Mon _____ Tue _____ Wed _____

Special lunch preference: Kosher _____ Vegetarian _____

Name _____

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HOTEL RESERVATION FORM

Mail before April 25, 1987 to:

ACM SIGACT Symposium on Theory of Computing
Grand Hyatt New York
Park Avenue at Grand Central
New York, NY 10017

Telephone: (212) 883-1234 Telex: 645601

Single \$105/day _____ Double \$105/day _____ Triple \$125/day _____

Rates subject to New York State tax and New York City occupancy tax. Check-in: 3 pm. Check-out: 12 noon.

Arrival Date _____ Time _____

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For arrivals after 6pm, the hotel requests that you *guarantee* your room by providing a major credit card number or a check for one night's deposit.

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STOC '87 Program
Monday May 25, 1987

Session 1: Ballrooms C&D

Chair: Alfred Aho

- 9:00 *Matrix Multiplication via Behrend's Theorem.* D. Coppersmith and S. Winograd, (IBM Watson).
9:20 *Solving Minimum-Cost Flow Problems by Successive Approximation.* A. Goldberg, (MIT), and R. Tarjan, (Princeton and AT&T Bell Labs).
9:40 *A New Approach to All Pairs Shortest Paths in Planar Graphs.* Greg N. Frederickson, (Purdue).
10:00 *An Algorithm for Linear Programming which Requires $O((m+n)n^2 + (m+n)^{1.5n}L)$ Arithmetic Operations.* Pravin M. Vaidya, (AT&T Bell Labs).
10:20 **Coffee Break**

Session 2: Ballrooms C&D

Chair: Frances Yao

- 11:00 *A Linear Time Algorithm for Computing the Voronoi Diagram of a Convex Polygon.* A. Aggarwal, (IBM Watson), L. Guibas, (Stanford and DEC SRC), J. Saxe, (DEC SRC), and P. Shor, (AT&T Bell Laboratories).
11:20 *Testing for Cycles in Infinite Graphs with Periodic Structure.* K. Iwano and K. Steiglitz, (Princeton).
11:40 *Approximation Algorithms for Shortest Path Motion Planning.* Ken Clarkson, (AT&T Bell Laboratories).
12:00 *The Complexity of Cutting Convex Polytopes.* B. Chazelle, (Princeton), H. Edelsbrunner, (Illinois), and L. Guibas, (Stanford and DEC SRC).
12:20 **Lunch: Ballrooms A&B**

Session 3: Ballrooms C&D

Chair: Michael Sipser

- 2:00 *Algebraic Methods in the Theory of Lower Bounds for Boolean Circuit Complexity.* R. Smolensky, (UC Berkeley).
2:20 *Optimal Bounds for Decision Problems on the CRCW PRAM.* P. Beame and J. Hastad, (MIT).
2:40 *Two Tapes Are Better than One for Offline Turing Machines.* W. Maass, (Illinois), G. Schnitger, (Penn. State), and E. Szemerédi, (Rutgers and Hungarian Academy of Sciences).
3:00 *Finite Monoids and the Fine Structure of NC^1 .* D. Barrington, (U. Mass.), and D. Thérien, (McGill).
3:20 **Coffee Break**

Session 4: Ballrooms C&D

Chair: Dexter Kozen

- 3:40 *The Strong Exponential Hierarchy Collapses.* Lane A. Hemachandra, (Cornell University).
4:20 *The Boolean Formula Value Problem is in $ALOGTIME$.* Samuel R. Buss, (UC Berkeley).
4:40 *Deterministic Simulation in $LOGSPACE$.* M. Ajtai, (IBM ARC), J. Komlós, (UC San Diego), and E. Szemerédi, (Rutgers).
5:00 *A Semi-Unboundedness Property that Characterizes $LOGCFL$.* H. Venkateswaran, (Georgia Institute of Technology).
9:00pm **Business Meeting: Ballrooms C&D**

Tuesday, May 26, 1987

Session 5: Ballrooms C&D

Chair: **Michael Luby**

- 8:40 *Some Consequences of the Existence of Pseudorandom Generators.* **E. Allender**, (Rutgers).
9:00 *Efficiency Considerations in Using Semi-random Sources.* **Umesh V. Vazirani**, (Harvard).
9:20 *Imperfect Random Sources and Discrete Controlled Sources.* **D. Lichtenstein**, (Yale), **N. Linial**, (Hebrew U.), and **M. Saks**, (Bell Communications Research and Rutgers).
9:40 *The Power of Randomness for Communication Complexity.* **M. Fürer**, (Zürich).
10:00 *Towards a Theory of Software Protection and Simulation by Oblivious RAMs.* **Oded Goldreich**, (Technion).
10:20 **Coffee Break**

Session 6: Ballrooms C&D

Chair: **Manuel Blum**

- 11:00 *On Hiding Information from an Oracle.* **M. Abadi**, (DEC SRC), **J. Feigenbaum**, (AT&T Bell Laboratories), and **J. Killian**, (MIT).
11:20 *The Complexity of Perfect Zero-Knowledge.* **Lance Fortnow**, (MIT).
11:40 *Zero Knowledge Proofs of Identity.* **U. Feige**, (Weizmann), **A. Fiat**, (UC Berkeley), and **A. Shamir**, (Weizmann).
12:00 *How to Play Any Mental Game.* **O. Goldreich**, (Technion), **S. Micali**, (MIT), and **A. Wigderson**, (Hebrew U.).
12:20 **Lunch: Ballrooms A&B**

Session 7: Ballrooms C&D

Chair: **Joseph Halpern**

- 2:00 *Optimal Distributed Algorithms for Minimum Weight Spanning Tree, Counting, Leader Election and Related Problems.* **B. Awerbuch** (MIT).
2:20 *Analysis of Backoff Protocols for Multiple Access Channels.* **J. Hastad**, **T. Leighton**, and **M. Rogoff**, (MIT).
2:40 *Dynamic Parallel Complexity of Computational Circuits.* **G. Miller** and **S. Teng**, (USC).
3:00 *Constructing Disjoint Paths on Expander Graphs.* **D. Peleg**, (Stanford), and **E. Upfal**, (IBM ARC).
3:20 *Reconfiguring a Hypercube in the Presence of Faults.* **J. Hastad**, **T. Leighton**, and **M. Newman**, (MIT).
3:40 **Coffee Break**

Session 8: Ballrooms C&D

Chair: **Joseph Halpern**

- 4:10 *On the Learnability of Boolean Formulae.* **M. Kearns**, (Harvard), **M. Li**, (Harvard), **L. Pitt**, (Illinois), and **L. Valiant**, (Harvard).
4:30 *On Learning Boolean Functions.* **B. K. Natarajan**, (CMU).
4:50 *An Hierarchical Memory Model.* **A. Aggarwal**, **B. Alpern** and **A. Chandra**, (IBM Watson).
5:10 *Parallel Symmetry-Breaking in Sparse Graphs.* **A. Goldberg**, (MIT), **S. Plotkin**, (MIT), and **G. Shannon**, (Purdue).

Wednesday, May 27, 1987

Session 9: Ballrooms C&D

Chair: **Michael Luby**

- 9:00 *A Random NC Algorithm for Depth First Search.* **A. Aggarwal**, (IBM Watson), and **R. Anderson**, (Washington).
9:20 *A New Graph Triconnectivity Algorithm and Its Parallelization.* **G. Miller**, (USC), and **V. Ramachandran**, (Illinois).
9:40 *Matching is as Easy as Matrix Inversion.* **K. Mulmuley**, (UC Berkeley), **U. V. Vazirani**, (Harvard), and **V. V. Vazirani**, (AT&T Bell Labs).
10:00 *Fast Parallel Algorithms for Chordal Graphs.* **J. Naor**, (Hebrew U.), **M. Naor**, (UC Berkeley), and **A. Schäffer**, (Stanford U.).
10:20 **Coffee Break**

Session 10: Ballrooms C&D

Chair: **Andrea LaPaugh**

- 11:00 *Two Algorithms for Maintaining Order in a List.* **P. Dietz**, (Schlumberger-Doll), **D. Sleator**, (CMU).
11:20 *An Optimal Online Algorithm for Metrical Task Systems.* **A. Borodin**, (Toronto), **N. Linial**, (Hebrew U.), and **M. Saks**, (Rutgers and Bell Communications Research).
11:40 *Searching a Two Key Table Under a Single Key.* **J. Ian Munro**, (Waterloo).
12:00 *The Pagenumber of Genus g Graphs is $O(g)$.* **L. Heath**, (MIT), and **S. Istrail**, (Wesleyan).
12:20 **Lunch: Ballrooms A&B**

Session 11: Ballrooms C&D

Chair: **Manuel Blum**

- 2:00 *Simple Algebras are Difficult.* **L. Rónyai**, (Hungarian Academy of Sciences).
2:20 *Permutation Groups in NC.* **L. Babai**, (Eötvös and Chicago), **E. Luks**, (Oregon), and **A. Seress**, (Hungarian Academy of Sciences).
2:40 *Zero-One Laws for Sparse Random Graphs.* **S. Shelah**, (Jerusalem), and **J. Spencer**, (Stony Brook).
3:00 *The Decision Problem for the Probabilities of Higher-Order Properties.* **P. Kolaitis** and **M. Vardi**, (IBM ARC).
3:20 **Coffee Break**

Session 12: Ballrooms C&D

Chair: **Michael Sipser**

- 3:40 *Size-Time Complexity of Boolean Networks for Prefix Computations.* **G. Bilardi**, (Cornell), and **F. P. Preparata**, (Illinois).
4:00 *Single-Factor Hensel Lifting and its Application to the Straight-Line Complexity of Certain Polynomials.* **Erich Kaltofen**, (RPI).
4:20 *Realistic Analysis of Some Randomized Algorithms.* **Eric Bach**, (Wisconsin).
4:40 *Recognizing Primes in Random Polynomial Time.* **L. Adleman** and **M. Huang**, (USC).