

Computational Complexity

Fifteenth Annual IEEE Conference

Sponsored by
The IEEE Computer Society
Technical Committee on
Mathematical Foundations
of Computing

In cooperation with
ACM-SIGACT and EATCS

July 4-7, 2000

Florence, Italy

ADVANCE REGISTRATION FORM

Last name _____

First name _____

Affiliation _____

Mailing address _____

E-Mail address _____

Homepage _____

Telephone _____

Special dietary needs _____

(Please, circle one below)

Conference Fees* (In Italian Lire)

	Advance [†]	Late
Members [‡]	550,000	660,000
Nonmembers	690,000	835,000
Students	275,000	335,000

*The registration fee includes proceedings and lunches

[†]The advance registration deadline is May 27.

[‡]ACM, EATCS, IEEE, or SIGACT members.

Conference Payment Computation:

Registration fee _____

(Membership type/number _____)

Extra proceedings (L82,000 each) _____

Extra reception ticket (L70,000 each) _____

Voluntary contribution _____

Total _____

(Please fill in the next page too, it includes method
of payment)

HOTEL RESERVATION FORM

The deadline for hotel reservations is May 27. After this date, proposed accommodation and rate is not guaranteed.

(Please, circle one below)

Hotel selection: prices in Lire

	Londra	Cavour Malaspina	Bellettini Le Vigne
Single		200,000	150,000
Dble as single	250,000	270,000	180,000
Dble	300,000	300,000	200,000

Hotel Payment Computation:

First night deposit _____

Reservation fee (L25,000) _____

Total _____

Arrival	Departure	Total
Date	Date	Nights
_____	_____	_____

Method of Payment

(For conference registration and hotel reservation. At the time of printing, the exchange rate is L2,058 to 1 USD. Rates fluctuate.)

VISA American Express
 MasterCard

Credit Card Number _____

Exp. Date _____

Name on Card _____

Signature _____

Bank transfer.

Make the transfer to Nova Sasco Viaggi, Cassa di risparmio di Parma e Piacenza S.p.a. Sede di Firenze C/C n. 2022/15. (Indicate that the payment is for the Computational Complexity Conference.)

Registration

Return both forms to:

NOVA SASCO VIAGGI srl
International Travel Office
P.le Porta al Prato 16/17r
50144 Firenze, Italy

Registration by fax is encouraged. The fax number is +39-055-367178. Put "Attention: Gianluca Merighi, Incoming & Congress Dpt." on the cover page.

Conference homepage

Information about this year's conference is available on the Web at

<http://www.dsi.unifi.it/~piluc/CCC2000>.

Information about the Computational Complexity conference is available at

<http://cs.utep.edu/longpre/complexity.html>.

Lodging

The following five hotels have been selected for the conference. Prices are given in Italian Lire.

1. Hotel Londra (****), Via Jacopo da Diacceto 16/20, 50123 Firenze, Italy. Phone: +39-055-2382791.
2. Hotel Cavour (***) superior), Via del Proconsole 3, 50122 Firenze, Italy. Phone: +39-055-282461.
3. Hotel Malaspina (***) superior), P.za Indipendenza 24, 50129 Firenze, Italy. Phone: +39-055-489869.
4. Hotel Bellettini (**), Via dei Conti 7, 50123 Firenze Italy. Phone: +39-055-213561.
5. Hotel Le Vigne (**): P.za S. Maria Novella 24, 50123 Firenze Italy. Phone: +39-055-294449.

The conference site can be reached by taking bus 23 from either the S. Maria Novella train station or from Duomo square. Directions and details will be available at this year's conference web site.

A first night deposit needs to accompany the reservation. There is also a registration fee of L25,000 which

must be included. You will be contacted promptly after receipt of your registration with the details of your accommodation. The rest of the hotel payment will be charged by the hotel at your departure. A cancellation penalty applies: first night deposit if before May 31st, 50% if before June 28, and total reserved amount after that.

Voluntary Contributions

Each year the Complexity Conference tries to support the travel and expenses of a few interested researchers from currency-poor countries. To help continue this practice we ask that participants make a donation of any amount. The donation can be included with your registration fee.

Additional Proceedings

Will be available on site at the cost of L82.000

Conference Information

Location Florence can overwhelm its visitors, with priceless art and historic architecture from the golden age of the Renaissance. Medieval and Renaissance palaces, churches and monuments follow one another in dizzying succession. Florence's combination of unequalled beauty with centuries of history is a heady mixture. The conference will be at the Banca Toscana Congress Centre, which provides ultra-modern technical facilities for video conferences, projectors, video projection, closed circuit TV, e-mail, and Internet. The Centre is located in Via Panciatichi 87, very close to the Riforma train station and at walking distance from the Dipartimento di Sistemi e Informatica (you need 15-20 minutes to reach the center of Florence by bus).

Social Program Registration will be at the conference site, starting Tuesday morning at 8:00 a.m. *Wednesday Afternoon:* There will be a business meeting at 2:30 p.m. at the conference site. *Wednesday Night:* There will be a reception at Hotel Baglioni at 7:30 p.m. Extra tickets are available.

Getting There

By airplane: There is an international airport in Florence. The train station is reachable either by bus 62 or by taxi. Other international airports are

in Pisa, Rome and Milan, in non-decreasing order of distance. To get to Florence by train is approximately 1 hour from Pisa, 2 hours from Rome, 3.5 hours from Milan. See the homepage for more information, or for information on traveling by automobile. ALITALIA is our Official Carrier. Contact an ALITALIA Office to request information and make reservations on available flights to FIRENZE (ITALY). Please mention the "WH" IDENTIFICATION CODE. If coming from the United States, you may also call the toll-free number 1-800-223-5730 to reserve flights and receive tickets by mail directly, giving both your "WH" IDENTIFICATION CODE and credit card number for payment. All participants will benefit of a special discount on available fares. For more information and the list of ALITALIA offices see <http://www.alitalia.it/eng/>.

Messages & Additional Information

Messages for attendees can be sent to the conference room at telephone +39-055-43915475. Electronic messages can be sent to ccc2000@dsi.unifi.it.

Structures Abstracts

Each year, brief abstracts on current research on topics covered by the conference are made available electronically a week before the conference. Submission is open to all. June 5 is the submission deadline. For details of submissions format send email to abstract@cs.umd.edu or contact the Abstracts Editor: William Gasarch; Dept. of Comp. Sci.; Univ. of Maryland at College Park; College Park, Maryland, 20742, Email: gasarch@cs.umd.edu.

Acknowledgments

Sponsors The conference is sponsored by the IEEE Computer Society Technical Committee for Mathematical Foundations of Computing in cooperation with ACM, SIGACT and EATCS. Additional support was provided by Alitalia, Banca Toscana, Dipartimento di Sistemi e Informatica, Università degli Studi di Firenze, Gruppo Nazionale per L'Informatica Matematica.

Local Arrangements Pierluigi Crescenzi (chair), Alberto Del Lungo, Roberto Grossi, Gianluca Rossi, Paola Salvi.

Program Committee Pavel Pudlak (Chair), Ricard Gavaldà, Russell Impagliazzo, Ran Raz, Alexander Razborov, Uwe Schöning, Denis Thérien, Luca Trevisan, Ramarathnam Venkatesan.

Conference Committee Eric Allender (Chair), Richard Beigel, Harry Buhrman, Lance Fortnow, Russell Impagliazzo, Luc Longpré, Madhu Sudan, Jacobo Torán.

PROGRAM

All sessions will be at the Banca Toscana Congress Centre. Rump sessions will be scheduled at the conference.

TUESDAY

8:50–9:00 Welcoming Remarks.

INVITED TALK: Chair P. Pudlák (Academy of Sciences, Czech Rep.)

9:00–10:30 *Time-Space Tradeoff Lower Bounds for Non-uniform Computation*, Paul Beame, (U. of Washington)

10:30–11:00 Break

SESSION 1: Chair P. Beame (U. of Washington)

11:00–11:30 *Time-Space Tradeoffs for Nondeterministic Computation*, Lance Fortnow (NEC Res. Inst.) and Dieter van Melkebeek (DIMACS)

11:30–12:00 *A Lower Bound for the Shortest Path Problem*, Ketan Mulmuley (U. of Chicago) and Pradyut Shah (U. of Chicago)

12:00–12:30 *Time-Space Lower Bounds for SAT on Uniform and Non-Uniform Machines*, Iannis Tourlakis (U. of Toronto)

SESSION 2: Chair R. Gavaldà (U. Polit. de Catalunya)

2:00–2:30 $BP(f) = O(L(f)^{1+\epsilon})$, Oliver Giel (U. Dortmund)

2:30–3:00 *The Communication Complexity of Enumeration, Elimination, and Selection*, Andris Ambainis (U. of CA at Berkeley), Harry Buhrman (CWI), William Gasarch (U. of MD at College Park), Bala Kalyanasundaram (U. of Pittsburgh), and Leen Torenvliet (U. of Amsterdam)

3:00–3:30 *The query complexity of order-finding*, Richard Cleve (U. of Calgary)

3:30–4:00 Break

SESSION 3: Chair D. Thérien (McGill U.)

4:00–4:30 *On the Complexity of Some Problems on Groups Input as Multiplication Tables*, David Mix Barrington (U. of Mass at Amherst), Peter Kadam (U. Tübingen), Klaus-Jorn Lange (U. Tübingen) and Pierre McKenzie (U. de Montréal)

4:30–5:00 *The Complexity of Tensor Calculus*, Carsten Damm (U. Trier), Markus Holzer (U. Trier) and Pierre McKenzie (U. de Montréal)

5:00–5:30 *The Complexity of Verifying the Characteristic Polynomial and Testing Similarity*, Thanh Minh Hoang (U. Ulm) and Thomas Thierauf (U. Ulm)

WEDNESDAY

SESSION 4: Chair U. Schöning (U. Ulm)

9:00–9:30 *A dual version of Reimer's inequality and a proof of Rudich's conjecture*, Jeff Kahn (Rutgers U.), Michael Saks (Rutgers U.) and Cliff Smyth (Rutgers U.)

9:30–10:00 *Computational complexity and phase transitions*, Gabriel Istrate (Los Alamos Nat. Lab.)

10:00–10:30 *An application of matroid theory to the SAT problem*, Oliver Kullmann (U. of Toronto)

10:30–11:00 Break

SESSION 5: Chair L. Trevisan (Columbia U.)

11:00–11:30 *New Bounds for the Language Compression Problem*, Harry Buhrman (CWI), So-

phie Laplante (U. Paris-Sud) and Peter Miltersen (BRICS)

11:30–12:00 *Combinatorial interpretation of Kolmogorov complexity*, Andrei Romashchenko, Alexander Shen and Nikolai Vereshchagin (Moscow State U.)

12:00–12:30 *Independent minimum length programs to translate between given strings*, Nikolai K. Vereshchagin (Moscow State U.) and Michael Vyugin (Moscow State U.)

BUSINESS MEETING: Starting at 2:30, followed by a rump/problem session.

RECEPTION: Starting at 7:30 at Hotel Baglioni.

THURSDAY

TUTORIAL 1: Chair P. Pudlák (Academy of Sciences, Czech Rep.)

9:00–10:30 *A Survey of Optimal PCP Characterizations of NP*, Luca Trevisan (Columbia U.)

10:30–11:00 Break

SESSION 6: Chair A. Razborov (Steklov. Math. Inst.)

11:00–11:30 *Easiness assumptions and hardness tests: Trading time for zero*, (BEST STUDENT PAPER) Valentine Kabanets (U. of Toronto)

11:30–12:00 *Dimension in Complexity Classes*, Jack H. Lutz (Iowa State U.)

12:00–12:30 *Average Case Complexity of Unbounded Fanin Circuits*, Andreas Jakobý (U. of Toronto and Med. U. zu Lübeck) and Rüdiger Reischuk (Med. U. zu Lübeck)

SESSION 7: Chair R. Venkatesan (Microsoft)

2:00–2:30 *On the Hardness of 4-coloring a 3-colorable graph*, Venkatesan Guruswami (MIT) and Sanjeev Khanna (U. of Penn. at Philadelphia)

2:30–3:00 *Deciding the K-dimension is PSPACE-complete*, Marcus Schaefer (DePaul U.)

3:00–3:30 *Integer Circuit Evaluation is PSPACE-complete*, Ke Yang (Carnegie Mellon U.)

3:30–4:00 Break

SESSION 8: Chair R. Raz (Weizmann Inst.)

4:00–4:30 *A Separation of Determinism, Las Vegas, and Nondeterminism for Picture Recognition*, Pavol Ďuriš (Tech. U. Aachen), Juraj Hromkovič (Tech. U. Aachen) and Katsushi Inoue (Yamaguchi U.)

4:30–5:00 *On the Complexity of intersecting finite state automata*, George Karakostas (Princeton U.), Richard Lipton (Princeton U. and Telcordia) and Anastasios Viglas (Princeton U.)

5:00–5:30 *On the Complexity of the Monotonicity Verification*, Andrei A. Voronenko (Moscow State U.)

FRIDAY

TUTORIAL 2: Chair P. Pudlák (Academy of Sciences, Czech Rep.)

9:00–10:30 *What complexity and cryptography can teach each other*, Russell Impagliazzo (UC San Diego)

10:30–11:00 Break

SESSION 9: Chair R. Impagliazzo (UC San Diego)

11:00–11:30 *Quantum Kolmogorov Complexity*, André Berthiaume (DePaul U.), Wim van Dam (CWI) and Sophie Laplante (U. Paris Sud)

11:30–12:00 *On the Complexity of Quantum ACC*, Frederic Green (Clark U.) Steven Homer (Boston U.) and Christopher Pollett (UC Los Angeles)

12:00–12:30 *Three Approaches to the Quantitative Definition of Information in an Individual Pure Quantum State*, Paul Vitanyi (CWI)

12:30–13:00 *Characterization of Non-Deterministic Quantum Query and Quantum Communication Complexity*, Ronald de Wolf (CWI)