

# Computational Complexity

Twelfth Annual IEEE Conference

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

In cooperation with  
ACM-SIGACT and EATCS

June 24 — 27, 1997

Ulm, Germany

## ADVANCE REGISTRATION FORM

Last name \_\_\_\_\_

First name \_\_\_\_\_

Affiliation \_\_\_\_\_

Mailing address \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

E-Mail address \_\_\_\_\_

Homepage \_\_\_\_\_

Telephone \_\_\_\_\_

Registration fee \_\_\_\_\_

Extra proceedings (\$40 or 65 DM) \_\_\_\_\_

Extra banquet tickets \_\_\_\_\_

Voluntary contribution \_\_\_\_\_

Total \_\_\_\_\_

*See below for methods of payment.*

(Please, circle one below)

### Conference Fees\* (In Deutsche Mark)

	Advance <sup>†</sup>	Late
Members <sup>‡</sup>	DM 350	DM 450
Nonmembers	DM 450	DM 550
Students	DM 200	DM 290
Extra Banquet Ticket	DM 65	DM 65

### Conference Fees\* (In US Dollars)

	Advance <sup>†</sup>	Late
Members <sup>‡</sup>	\$ 225	\$ 280
Nonmembers	\$ 280	\$ 340
Students	\$ 130	\$ 180
Extra Banquet Ticket	\$ 40	\$ 40

\*The registration fee includes proceedings, lunches, and all social events.

<sup>†</sup>The advance registration deadline is May 10.

<sup>‡</sup>ACM, EATCS, IEEE, or SIGACT members.

## HOTEL RESERVATION FORM

Last name \_\_\_\_\_

First name \_\_\_\_\_

Mailing address \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Telephone Number \_\_\_\_\_

Telefax Number \_\_\_\_\_

**Hotel selection:** Please indicate first and second choice.

Category: \_\_\_\_\_

Single room

Double room, shared with \_\_\_\_\_

Arrival	Departure	Total
Date _____	Date _____	Nights _____

### Return both forms to:

Prof. Dr. Uwe Schöning  
Complexity Conference  
Abt. Theoretische Informatik  
Universität Ulm  
Oberer Eselsberg  
89069 Ulm, Germany

**Telefax number:** ++49 731 502 4102

## Conference homepage

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

<http://www.informatik.uni-ulm.de/ti/CCC>.

Information about the Computational Complexity conference is available at

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

## Lodging

Hotels selected for the conference fall in three categories:

1. Single room 100–120 DM. Double room 135 DM (Rooms with bath/shower and WC)
2. Single room 65–75 DM. Double room 110 DM (Rooms with bath/shower and WC)
3. Single room 45 DM. Double room 75–90 DM (Rooms without bath/shower and without WC)

The first category corresponds to the Hotels Ibis (Neutorstraße 12) and Goldener Bock (Bockgasse 25). Hotels Bäumle (Kohlgasse 6) and Münster (Münsterplatz 14) have rooms in both categories 2 and 3. In all categories, the price includes breakfast. There is only a small contingent of rooms from categories 2 and 3, and students will be given preference for these rooms. Reservations should be sent with the registration form, and payment is made at the hotel. Only the hotels from the first category can handle credit cards.

All four hotels are within walking distance from Ulm central train station and from the city center, and have good bus connection to the University (see the city map at the conference homepage). The conference homepage also contains a list of fancier hotels, with descriptions and prices. These can be booked directly.

## 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.

## Methods of Payment

Payment for the conference can be made in Deutsche Mark or in US Dollars. Credit cards are not accepted, but personal checks are allowed, even in dollars. Make out checks to “Uni. Ulm, Projekt Nr. 70106, Prof. Schöning”. It is also possible to make a money transfer to the account of the University of Ulm:

Konto 1112 800 600, BW Bank,  
(BLZ 630 201 30)  
mentioning the above “Projekt Nr.”

## Special Dietary Needs

Vegetarian food will be available. If you have special dietary needs, please contact the local organizers.

## Additional Proceedings

Will be available on site at the cost of DM 65 or \$40 each.

## Conference Information

**Location** Ulm is located in the south of Germany, between Stuttgart and Munich on the Danube river. The city was founded in the 9th century and soon became a leading center for arts and commerce. Many of its buildings reflect its local history, in particular the old town along the Danube in the former fishermen’s quarters. Ulm is famous for its gothic cathedral, the tallest religious building in the world (161m). More information about the city can be seen at the conference homepage.

The conference is being held at the University of Ulm, in building O27, lecture room H20. The University is located on top of a hill (Eselsberg) close to the city, and is reachable from the center by bus lines 3 and 5.

**Social Program** *Monday Night:* There will be a reception, starting at 19:00, in the Villa Eberhardt, a beautiful building from the last century. The address is Heidenheimerstraße 80. The villa can be reached by bus line 4, stopping at Steinhövelstraße and walking some meters uphill. *Wednesday Night:* There will a business meeting in the University. *Thursday:* There will be a guided tour through the

old town and the cathedral. Afterwards there is a banquet in the traditional German restaurant “Zunftthaus der Schiffsleute”.

## Getting There

**By airplane:** The closest airports are in Stuttgart, Munich and Frankfurt. Ulm can be reached by train from these airports (approximately 2 hours from Stuttgart and Munich, and 3 hours from Frankfurt), over the central train stations. The train stations are reachable from the airports by subway. See the homepage for more information, or for information on traveling by automobile.

## Messages & Additional Information

Messages for attendees can be left with the secretary of the Dept. of Theoretical Computer Science at telephone ++49 731 502 4101. Electronic messages can be sent to [schoenin@informatik.uni-ulm.de](mailto:schoenin@informatik.uni-ulm.de) or [toran@informatik.uni-ulm.de](mailto:toran@informatik.uni-ulm.de).

## 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 the Ulmer Universitäts-Gesellschaft, Daimler Benz, the Sparkasse Ulm and the Universitat Politècnica de Catalunya.

**Local Arrangements** Uwe Schöning (co-chair), Jacobo Torán (co-chair).

**Program Committee** José Balcázar (Chair), Harry Buhrman, Pierluigi Crescenzi, Georg Gottlob, Toniann Pitassi, Ran Raz, Miklos Santha, Klaus Wagner.

**Conference Committee** Steve Homer (Chair), Eric Allender, Jin-Yi Cai, Anne Condon, Joan Feigenbaum, Lance Fortnow, Luc Longpré, Avi Wigderson.

## 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 18 is the submission deadline. For details of submissions format send email to [abstract@cs.umd.edu](mailto: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](mailto:gasarch@cs.umd.edu).

## PROGRAM

All sessions will be at University Ulm, building O27, room H20. Rump sessions will be scheduled at the conference.

**RECEPTION/REGISTRATION:** Monday, June 23, starting at 19:00 at the Villa Eberhard.

## TUESDAY

**SESSION 1:** Tuesday, June 24, Morning  
Chair: J.L. Balcázar (U. Politécnic, Barcelona)

9:00–9:45 *Six hypotheses in search of a theorem*, H. Buhrman (CWI Amsterdam), L. Fortnow (U. Chicago and CWI Amsterdam), L. Torenvliet (CWI Amsterdam)

9:45–10:15 *Inequalities for Shannon entropies and Kolmogorov complexities*, D. Hammer (TU Berlin), A. Romashchenko (Moscow State U.), A. Shen (IPIT Moscow), N. Vereshchagin (Moscow State U.)

10:15–10:45 Break

10:45–11:20 *Circuits over PP and PL*, R. Beigel (Yale, U. Maryland, Lehigh), B. Fu (Yale, U. Maryland)

11:20–11:45 *The general notion of a dot operator*, B. Borchert (U. Heidelberg), R. Silvestri (U. Roma La Sapienza)

11:45–12:15 *Reversible space equals deterministic space*, K.J. Lange (U. Tübingen), P. McKenzie (U. Montréal), A. Tapp (U. Montréal)

**SESSION 2:** Tuesday, June 24, Afternoon

Chair: H. Buhrman (CWI Amsterdam)

14:30–15:00 *Nondeterministic polynomial time versus nondeterministic logarithmic space*, L. Fortnow (U. Chicago and CWI Amsterdam)

14:50–15:30 *Polynomial vicinity circuits and nonlinear lower bounds*, K. Regan (SUNY Buffalo)

15:30–16:00 Break

16:00–16:30 *A note on universal distributions for polynomial-time computable distributions*, R. Schuler (U. Ulm)

16:30–17:00 *LR(k) testing is average-case complete*, C. Karg (U. Ulm)

## WEDNESDAY

**SESSION 3:** Wednesday, June 25, Morning

Chair: K. Wagner (U. Würzburg)

9:00–9:45 *Logic Programming: complexity and expressive power*, G. Gottlob (TU. Wien)

9:45–10:15 *Hyper-polynomial hierarchies and the NP-jump*, S. Fenner (U. Southern Maine), S. Homer, R. Pruim (Boston U.), M. Schaefer (U. Chicago)

10:15–10:45 Break

10:45–11:15 *The density of weakly complete problems under adaptive reductions*, J. Lutz (Iowa State U.), Y. Zhao (LANShark Systems)

11:15–11:45 *Separating NP-completeness notions under strong hypotheses*, K. Ambos-Spies, L. Bentzien (U. Heidelberg)

11:45–12:15 *Undecidability results for low complexity degree structures*, R. Downey (Victoria U.), A. Nies (U. Chicago)

**SESSION 4:** Wednesday, June 25, Afternoon

Chair: M. Santha (U. Paris-Sud)

14:30–15:00 *On  $TC^0$ ,  $AC^0$ , and arithmetic circuits*, M. Agrawal (IIT Kanpur), E. Allender (Rutgers U.), S. Datta (Rutgers U.)

15:00–15:30 *Upper and lower bounds for some depth-3 circuit classes*, R. Beigel (Yale, U. Maryland, Lehigh), A. Maciel (U. Maryland)

15:30–16:00 Break

16:00–16:30 *Circuit bottom fan-in and computational power*, L. Cai (Ohio U.), J. Chen (Texas A&M U.), J. Håstad (KTH Stockholm)

16:30–17:00 *A lower bound for perceptrons and an oracle separation of the PP (PH) hierarchy*, C. Berg, S. Ulfberg (KTH Stockholm)

**BUSINESS MEETING:** Starting at 19:00 at the University.

## THURSDAY

**SESSION 5:** Thursday, June 26, Morning

Chair: S. Homer (Boston U.)

9:00–9:45 *On Operators of Higher Types*, H. Vollmer, K. Wagner (U. Würzburg)

9:45–10:15 *Time bounded frequency computations*, M. Hinrichs, G. Wechsung (Friedrich-Schiller U. Jena)

10:15–10:45 Break

10:45–11:15 *Circuits and expressions with nonassociative gates*, J. Berman (SUNY Binghamton), A. Drisko (National Security Agency), F. Lemieux (McGill U.), C. Moore (Santa Fe Institute), D. Thérien (McGill U.)

11:15–11:45 *A nonadaptive NC checker for permutation group intersection*, V. Arvind (IMS Madras), J. Torán (U. Ulm)

11:45–12:15 *Acceptance by transformation monoids (with an application to local self reductions)*, U. Hertrampf (U. Stuttgart)

**SESSION 6:** Thursday, June 26, Afternoon

Chair: P. Crescenzi (U. Roma La Sapienza)

14:00–14:30 *On randomization in online computation*, A. Borodin (U. Toronto), R. El-Yaniv (Hebrew U.)

14:30–15:00 *Randomized simultaneous messages: solution of a problem of Yao in communication complexity*, L. Babai, P. Kimmel (U. Chicago)

15:00–15:30 *The communication complexity of the universal relation*, G. Tardos (Institute of the Hungarian Academy of Sciences and Institute for Advanced Study), U. Zwick (Tel Aviv U. and the International Computer Science Institute)

**THURSDAY AFTERNOON:** Guided tour through the city starting at 16:30.

**BANQUET:** Starting at 19:30 at the restaurant “Zunfthaus der Schiffsleute”.

## FRIDAY

**SESSION 7:** Friday, June 27, Morning

Chair: G. Gottlob (TU Wien)

9:00–9:45 *A taxonomy of approximation-preserving reducibilities*, P. Crescenzi (U. Roma La Sapienza)

9:45–10:15 *Tight bound on Johnson’s algorithm for Max-SAT*, J. Chen, D. Friesen, H. Zheng (Texas A&M U.)

10:15–10:45 Break

10:45–11:15 *Constraint satisfaction: the approximability of minimization problems*, S. Khanna (Bell Labs), M. Sudan (IBM T.J. Watson Research Center), L. Trevisan (U. Genève)

11:15–11:45 *A note on bottleneck counting argument*, J. Simon (U. Chicago), S.-C. Tsai (Chi-Nan International U.)

11:45–12:15 *Finite limits and monotone computation: the lower bound criterion*, S. Jukna (U. Trier)