

GATEWAY TO THE TWENTY FIRST CENTURY



29 September – 2 October 1996

Cambridge Marriott Hotel

Cambridge, Massachusetts

**1996 5TH IEEE INTERNATIONAL CONFERENCE ON
UNIVERSAL PERSONAL COMMUNICATIONS RECORD**

**VOLUME 2 OF 2
SESSIONS 7 – 12**



IEEE



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OFFICE OF THE MAYOR

CITY HALL, CAMBRIDGE, MASSACHUSETTS 02139

(617) 349-4321

Fax (617) 349-4287

Sheila Doyle Russell
Mayor

Greetings
to the
International Conference on
Universal Personal Communications
September 29, 1996

Dear Guests:

It is my great pleasure to welcome you and the ICUPC conference to the City of Cambridge. As you may know, the City of Cambridge has a proud tradition of supporting the personal communications industry. On October 9, 1876 Thomas Watson received the worlds first phone call at the Walworth Manufacturing Company in Cambridge, only a few blocks from the site of your conference. On the line was Alexander Graham Bell, one of Cambridge's most distinguished entrepreneurs.

As the host city for the International Conference on Universal Personal Communications, Cambridge reinforces its tradition as the birthplace of new and innovative personal communication technology. Hosting the ICUPC conference may provide Cambridge with the distinction of birthplace for 20th and 21st century communications!

The City of Cambridge offers a wide array of interesting activities and attractions that reflect the international influence of our city's academic institutions. Harvard Square and Central Square offer an abundance of eclectic shops, bookstores and restaurants that will enrich your visit to Cambridge

Please accept my best wishes for a pleasant and productive visit in the City of Cambridge. I know that your conference will be interesting and rewarding.

Sincerely,

Sheila Doyle Russell
Sheila Doyle Russell
Mayor



Sheila Doyle Russell,
Cambridge Mayor



GENERAL INFORMATION

ICUPC '96 takes place 29 September – 2 October 1996, in Cambridge, Massachusetts, U.S.A.

The Cambridge Center Marriott Hotel serves as ICUPC '96 headquarters. Here you will find yourself in the heart of Kendall Square, on the scenic Charles River.

Conveniently located in the middle of a historic and cultural city, Cambridge has much to offer. M.I.T., Harvard University and Harvard Square are just minutes away. Two subway stops from downtown Boston, and four miles from Logan Airport, everything is easily accessible.

Many historical Boston sites are nearby and easy to visit, including: Faneuil Hall Market Place, Beacon Hill, U.S.S. Constitution, Boston Tea Party Ship and, of course, the Freedom Trail.

Located near four large malls, this is a shopper paradise that can't be missed. The night life in Cambridge and Boston is filled with fun and exciting places to visit and restaurants to try. There are many different types of food from which to select. And restaurant styles range from the finest dining to most casual, so finding some place that fits your appetite will not be a problem.

After a long day it's nice to unwind at a place "where everybody knows your name." Come hangout at the original Cheers of Boston. There are also many dance, jazz and blues clubs to make your evening enjoyable.

LOCAL SIGHTS

REGISTRATION HOURS

SUNDAY, SEPTEMBER 29TH	10:00AM TO 7:00PM
MONDAY, SEPTEMBER 30TH	7:00AM TO 5:00PM
TUESDAY, OCTOBER 1ST	7:00AM TO 5:00PM
WEDNESDAY, OCTOBER 2ND	7:00AM TO 12NOON

Welcoming Reception

Sunday, 29 September 1996
6:30 PM

Hosted by the Massachusetts Telecommunications Council, please join us for the Reception at the famous Boston Museum of Science. Here you will experience interactive exhibits, the Charles Hayden Planetarium and the Omni theater. A good time is sure to be had by everyone.

A free shuttle service will be available from the Cambridge Center Marriott Hotel.

Welcome Breakfast

Monday, 30 September
1996
8:00AM

Good Morning ICUPC '96! A sit-down breakfast will be served starting at 8:00AM in Salons 1-4 at the Cambridge Center Marriott Hotel. Enjoy good food and good company before a busy day of sessions.

The Plenary Session will begin immediately after breakfast.

Conference Banquet

Tuesday, 1 October 1996
7:00PM

The closing dinner will take place at the Cambridge Center Marriott Hotel. Before ICUPC '96 comes to a close, enjoy one final night with new and old friends. This dinner will take place starting at 7:00PM in Salons 1-4.

Continental Breakfasts

Monday, 30 September
Tuesday, 1 October
Wednesday, 2 October
Each morning, 7:00 to 8:00AM

A continental breakfast will be available each morning, providing an opportunity for attendees and technical session speakers to meet and exchange ideas.

SOCIAL EVENTS

ICUPC '96 EXECUTIVE COMMITTEE

CONFERENCE CHAIR:

Donald H. Steinbrecher

CONFERENCE VICE CHAIRS:

EUROPE: Federico Tosco

ASIA/PACIFIC: Takeshi Hattori

NORTH AMERICA: Stuart Lipoff

TECHNICAL PROGRAM CHAIR:

John G. Proakis

TECHNICAL PROGRAM ADMINISTRATOR:

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fred harris

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- Co-Chairman: Donal H. Steinbrecher
- Technical Program Chair: Jack Proulx
- ICUPC '96 Co-Chair: Neil C. Aspert
- Conference Vice Chair: Mark Shuster
- Conference Vice Chair: Ernest Poon
- Conference Vice Chair: John Pappalardo
- Finance Co-Chair: Howard Eason
- Chair of Plenary: Jeff Meek
- Registration Chair: Kimberly Travers
- Local Arrangements Chair: Katherine Hagan
- Public Relations Chair: Greg Smith
- Conference Executive Committee: Anna Pilon

Conference Registration:
 TOLL FREE 1-800-352-2222
 BOSTON, MA 02115
 TEL: 617-252-2222 FAX: 617-252-2167
 E-MAIL: ICUPC@COMNET
 http://www.comnet.com/icupc96/

Donald H. Steinbrecher
 Tellabs Wireless

Dear Colleagues:

The 1996 conference will be the fifth in this series of international conferences focused on Universal Personal Communications Services (PCS). Most of the 160 MHz allocated by the FCC for PCS have been auctioned and the winners are formulating their strategies, testing their concepts, and deploying their systems. ICUPC '96 is the first major conference exclusively devoted to this field of activity where the winners of the PCS auctions can present their initial encounters with this burgeoning market. Further, we expect to hear results from the PCS systems being aggressively tested and deployed in Europe, Japan, and other world markets.

ICUPC '96 will focus on the technical issues forming the foundation of the international PCS industry. We are seeing a growing emphasis on the network components and digital signal processing as newer systems take advantage of the technological advances of the last decade. Further, new deployment strategies emerging as antennas get smart, move indoors, track users and perform other dynamic feats to improve PCS system performance. As a delegate to ICUPC '96 you will be able to select from a wide variety of educational material and specialized subject matter focused on developing and deploying PCS in the next decade. The technical program is extremely broad with topics ranging from Asynchronous Transfer Mode to Wearable Personal Communications.

Approximately 200 technical contributions will be presented in 43 technical sessions, six panel discussions, eight tutorials and a full day short course on Modern Digital Receivers for the PCS environment. We are fortunate to have as our plenary speaker Professor Robert Gallager of the Massachusetts Institute of Technology. Professor Gallager has made many significant contributions in the fields of information theory and packet communications and is now conducting research in the wireless communications.

Do not miss the opening reception at the Boston Science Museum. It promises to be a spectacular event including a lightning demonstration using some of Dr. Tesla's research equipment salvaged from his MIT laboratory. My favorite is the MUGAR Omni Theater. You will be amazed by the audio and visual experience! This reception is sponsored by the members of the Massachusetts Telecommunications Council and will provide you with an opportunity to learn about the telecommunications capabilities located in Massachusetts.

The Greater Boston area is home for more than 60 colleges and universities, many with outstanding international reputations. The Cambridge Marriott the Conference Center for ICUPC '96 is located adjacent to the campus of the Massachusetts Institute of Technology and on the Red Line of the T, Greater Boston's metro transportation system. An unlimited three-day pass is available for \$9.00 U.S. and will allow you to visit most of the area's finest restaurants and museums. The T ride from Harvard Square (the home of Harvard University) to Park Street in downtown Boston (the beginning of Boston's Premier attraction: The Freedom Trail) is just 8 minutes and includes a stop at the Cambridge Marriott.

On behalf of the 1996 conference committee, I invite you to join your world-wide colleagues in the PCS industry at this main technical event for an exciting, stimulating and educational conference.

Sincerely,

Donald H. Steinbrecher, ICUPC '96 General Chair



Donald H. Steinbrecher



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