DISTINGUISHED LECTURER TOUR
STEFANO BREGNI – LECTURER
January 2006

AP DLT #1: 22 January – 1 February 2006
Topic: Synchronization of Digital Telecommunications Networks

Bombay – M.V. Pitke
Delhi – Ram Gopal Gupta
Bangalore - Raghavendra Swamy N Gulur
Kerala – Prem Kumar

DLT SUMMARY
The 2006 1st Distinguished Lecturer Tour of Stefano Bregni took place in India from 21 January to 2 February 2006. This DLT was organized by the joint effort of the AP Region Office (Fanny Su and Serena Dhing) and of the IEEE ComSoc Chapters of Mumbay, Delhi, Bangalore and Kerala.

Lectures entitled "Synchronization of Digital Telecommunications Networks" were given in the following locations:
- Bombay, Sardar Patel College of Engineering, 23 January 2006;
- Delhi, Indian Institute of Technology, 24 January 2006;
- Bangalore, Atria Hotel, 27 January 2006,
- Cochin, Kerala, Hotel Woods Manor, 28 January 2006,

The audience was composite and included professors, researchers and both undergraduate and graduated students, as well as technical personnel from the industry. According to the varied audience, the lecture was adjusted, to meet different expectations and interests.

TOUR OUTLINE
Sat Jan 21 flight Milano-Bombay
Sun Jan 22 sightseeing in Bombay
Mon Jan 23 lecture in Bombay
Tue Jan 24 flight Bombay-Delhi, lecture
Wed Jan 25 daily tour to Agra and Taj Mahal
Thu Jan 26 sightseeing in Delhi and flight Delhi-Bangalore
Fri Jan 27 sightseeing in Bangalore, lecture in Bangalore
Sat Jan 28 flight Bangalore-Cochin, lecture in Cochin
Sun Jan 29 houseboat tour in the Kerala backwaters
Mon Jan 30 daily tour to Periyar
Tue Jan 31 car transfer Cochin-Trivandrum, lecture in Trivandrum
Wed Feb 1 sightseeing in Trivandrum
Thu Feb 2 flight Trivandrum-Bombay-Milano

BOMBAY REPORT
The lecture "Synchronization of Digital Telecommunications Networks" was given at Sardar Patel College of Engineering on Monday 23 January 2006. The audience included a good number of professors, researchers and students. All were very interested. Before and after the lecture, it
was also possible to meet some professors of the College and of I.I.T., including the chair of Dept. of E.E.

My visit to Mumbai was well organized by M.V. Pitke and Ashok Jagatia, new chair of the Bombay ComSoc Chapter. I wish to thank them, for the effort spent to make my stay enjoyable, also beyond the lecture. Ashok organized for me a very good full-day sightseeing of Bombay on Sunday, offering car, driver and even the company of two students, Ankur and Gopal, who I thank as well. I was taken out for dinner and lunches in good places, which I liked very much. I enjoyed the warm company of all my hosts.

For accommodation, I was hosted in the I.I.T. old Guest House, which has limited facilities. For next DLTs, I would recommend a more comfortable hotel, possibly located in a central position (I was about 1 hour by car from downtown).

DELHI REPORT

The lecture "Synchronization of Digital Telecommunications Networks" was given at Indian Institute of Technology on Tuesday 24 January 2006. The audience included some professors, researchers and students. The organizers of my visit to Delhi were profs. Subrata Mukhopadhyay and Ranjan K. Mallik (IIT) and the IEEE section/ComSoc chapter chair Ram Gopal Gupta, who I thank very much.

The day after, I had an interesting tour to Agra to visit Taj Mahal and the Fort. I organized it from Italy, by my travel agency, since I definitely did not want to miss such a wonder only two hours by train from Delhi.

Thursday 26 January was Republic Day in India, which among the rest is celebrated with a big parade of Army forces in the main avenues of Delhi. I was suggested to carefully avoid attempting to go visiting monuments in Delhi, due to security forces blocking all the town and main roads, especially around Old and central New Delhi.

Actually, since my flight to Bangalore was scheduled for 5.50pm, I obviously could not resist confined and bored in the university area for one full day. Fortunately, the situation of roads was not bad: moving by rickshaw, I had no trouble to visit several nice tourist attractions, including Qutab Minar, Humayun's Tomb, Jama Masjid, some Old Delhi and even seeing the India gate (still closed in the afternoon after the parade).

For accommodation, I was hosted in the I.I.T. Main Guest House. Also in this case, for next DLTs, I would recommend a more comfortable hotel.

BANGALORE REPORT

The lecture "Synchronization of Digital Telecommunications Networks" was given at Atria Hotel, where I was accommodated, on Friday 27 January 2006. The audience included a good set of mainly professors/researchers and professionals, who were very interested and showed to appreciate the lecture with questions.

My lecture in Bangalore was effectively organized by Raghav Gulur (chair of the ComSoc Chapter) and "KKB". Also in this case, I wish to thank them, for the effort spent to make my stay enjoyable. I liked very much the warm company of Raghav and KKB and their careful attention to all details.
For accommodation, I was hosted in the 4* Atria Hotel, not far from central Bangalore. I thank my kind hosts also for this choice.

**KERALA REPORT**

The lecture "Synchronization of Digital Telecommunications Networks" was given on Saturday 28 January (Cochin) and Tuesday 31 January (Trivandrum). In both cases, the audience included a mix of professors, researchers and professionals, who were very interested and showed to appreciate the lecture.

The day after the lecture in Trivandrum, I even received the unexpected visit in the hotel of a group of researchers who attended the lecture the evening before and wanted to discuss with me a practical problem they are working on.

My visit to Kerala was effectively organized by Prem Kumar (chair of the ComSoc Chapter). Also in this case, I wish to thank him, for the effort spent to make my stay enjoyable. He organized two excellent tours for me: a day on a houseboat in the backwaters (a must in Kerala) and a day-trip to the wildlife refuge in Periyar. Although it was not possible to charge those tours on the chapter budget, he took care of all details to make me have an outstanding experience, from the car/driver, to choosing a good houseboat from the right agency, to students that accompanied me. Among them, I remember in particular Mr. Visan Koshy Varghese, of the IEEE Student branch, for the nice time I had with him.

For accommodation, I was hosted in good hotels in Cochin and Trivandrum.

**LECTURE TITLE**
Synchronization of Digital Telecommunications Networks

**LECTURE ABSTRACT**
Network synchronization has gained increasing importance in telecommunications throughout the last thirty years: digital switching, SDH/SONET, ATM, CDMA, GSM and UMTS are striking examples where network synchronization has been proven to affect quality of service.

In this tutorial lecture, synchronization processes at different levels in telecommunications are first reviewed and fundamental definitions about timing of digital signals, jitter and wander are introduced. Major topics of this tutorial are: timing aspects in SDH/SONET networks; architectures and requirements for timing transfer in PDH, SDH/SONET, ATM and fixed/mobile telephone networks; strategies, architectures and clocks for synchronization networks.