



The IEEE

Newsletter

PUBLICATION OF THE NORTH JERSEY SECTION OF THE INSITIUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS

Vehicular Technology Society:

Cellular Interference Management For Integrated Services Over CDMA

On Tuesday, the 25th of March 1997, the North Jersey Chapter of the IEEE Vehicular Technology Society will host a talk by Dr. Sanjiv Nanda on "Cellular Interference Management For Integrated Services Over CDMA".

About The Talk

The advantages of CDMA for cellular voice have become well known. Due to its interference averaging property, CDMA simply translates voice activity factor and antenna sectorization into capacity gains. Furthermore, RAKE receivers resolve the multipath components of the spread spectrum signal and translate it into diversity gain. Dr. Nanda will consider a system in which high rate packet-mode data users share the cellular CDMA band with conventional cellular voice users. He will propose a network-based burst level admission control that accounts for channel loading and interference (LIDA). Based on estimation of the in-cell and out-of-cell interference caused by a single high rate data user LIDA algorithms have been designed to allow burst access at M times the full rate. Dr. Nanda will present a class of algorithms based on the following:

- the load information in the cell and its neighbors,
- The pilot strength measurements provided by the mobile, and
- Coordination of the burst rate, burst length and burst starting time between neighbor cells.

Dynamic, packet-like demand-assigned access enables users with different services to access the channel at desired rates and QOS requirements. With best effort type QOS guarantees, the high data

rate service is well suited for typical internet and web applications (including services based on CDPD and mobile IP).

About The Speaker

Sanjiv Nanda received a Bachelor of Technology degree in Electrical Engineering from the Indian Institute of Technology, Kanpur, India in 1983, an MS degree in mathematics and MS and PhD degrees in Electrical Engineering, respectively, from the Rensselaer Polytechnic Institute, Troy, NY in 1986, 1985 and 1988, respectively. From 1989-90 he was with the Wireless Information Network Laboratory at Rutgers University, Piscataway, NJ, where he researched multiple access and resource allocation for wireless microcellular networks. He joined the Performance Analysis Department at Bell Laboratories (now part of Lucent Technologies) in 1990, where he is currently a member of the technical staff. His research interests involve design, performance study and modeling of wireless communications systems of the future. Dr. Nanda was co-recipient of the Jack Neubauer award of the IEEE Vehicular Technology Society for the best systems paper published in the IEEE Transactions on VT in 1991.

All Welcome

There is no admission charge, you need not be an IEEE member to attend. Light refreshments will be served.

Time: 7:30 PM, Tuesday, March 25, 1997

Place: Fairleigh Dickinson University, River Road and Route 4, Teaneck, NJ, Muscarelle Building, Room M207.

Information: Mel Lewis (914) 968-2500, ext. 2304 or Art Greenberg (201) 492-1207.

NJ PES/IAS:

Electric Vehicle Technology

The March 20, 1997 meeting of the NJ Section Power Engineering and Industrial Applications Society will present a talk on "Electric Vehicle Technology". The speaker will be Randy Evans of GPU Energy.

About The Talk

Topics to be discussed will include: history from early to current OEM vehicles; charging systems; battery systems; AC/DC motors; and future market applications.

Time: 7:00 PM, Thursday, March 20, 1997

Place: GPU Energy, 300 Madison Ave., Morristown, NJ.

Information: Ken Oexle (201) 386-1156.

Calling New Members!

The IEEE is the world's largest technical society. There are 315,000 members in 150 countries. Encourage your co-workers to join. Send us their names and addresses and they will receive an application and information on the benefits of becoming an IEEE member. Contact Don Weinstein, Kulite Semiconductor, One Willow Tree Road, Leonia, NJ 07605-2239, (201) 461-0900 ext. 234 mornings or Amy Galarowicz, Glatt Air Techniques Inc., 20 Spear Road, Ramsey, NJ 07446-1288, (201) 818-3740, FAX (201) 825-0389, email: a.e.galarowicz@ieee.org.

MARCH, 1997

MARCH, 1997

Volume 43, Number 9

Publication No: USPS 580-500

"The IEEE Newsletter" (North Jersey Section), is published monthly except July by The Institute of Electrical and Electronics Engineers, Inc. Headquarters: 345 East 47th Street, New York, NY 10017-2394. \$1.00 per member per year (included in annual dues) for each member of the North Jersey Section. Periodicals-class postage paid at New York, NY and at additional mailing offices. Postmaster send address changes to: "The IEEE Newsletter", 445 Hoes Lane, P.O. Box 1331, Piscataway, NJ 08855-1331. USPS 580-500 (ISSN 1076-3732).

NEWSLETTER STAFF

EditorTheresa Saracinello
Business Manager.....Keith Saracinello

Deadline for receipt of material is the 1st of the month preceding the month of publication. All communications concerning business matters, including advertising, should be addressed to: The IEEE Newsletter, c/o Girard Associates, Inc, 6 Robert Terrace, P.O. Box 455, Mt. Arlington, NJ 07856, (201) 398-5524. Editorial material should be sent to the editor at 96 Everett Rd, Parsippany, NJ 07054, (201) 515-8829.

IEEE NJ SECTION HOME PAGE

WWW at <http://hertz.njit.edu/~ieeenj>

REPORT ADDRESS CHANGES TO:

IEEE Service Center, 445 Hoes Lane, P.O. Box 1331, Piscataway, NJ 08855-1331, (908) 981-0060. It is not necessary to inform the North Jersey Section when you change your mailing address. "The IEEE Newsletter" and other section mailings use a list provided by IEEE's national headquarters.

SECTION OFFICERS

Chairman.....Arthur Greenberg
a.h.greenbert@ieee.org (201) 492-1207
Vice-Chairman-1.....Melvin Lewis
m.lewis@ieee.org (914) 968-2500 Ext. 2304
Vice-Chairman-2.....Dr. Fred Chichester
(201) 744-7340
Treasurer.....Dr. Chandra Gupta
Secretary.....Alan Stolpen
(201) 822-1300, ext. 2416

Members-at-Large:

Amy Galarowicz (201) 818-3740
a.e.galarowicz@ieee.org
Dr. Haim Grebel
Dr. Nirwan Ansari

The North Jersey Section Executive Committee usually meets the first Wednesday (except holidays and December) of each month at 7:00 PM. Meetings are open to all members. For information on meeting agenda call Secretary Alan Stolpen (201) 822-1300, ext. 2416.

IEEE AWARDS RECEPTION

North Jersey Section

May 4, 1997

Birchwood Manor, Whippany NJ

*A time to relax, unwind and enjoy --
A time to pay tribute to our new Fellows --
A time to honor our Award Winners --
YES it's time for the Annual Section Reception*

The Annual Section IEEE Awards Reception will be held at the Birchwood Manor, 111 North Jefferson Road, Whippany again this year. The affair is scheduled for **Sunday, May 4, 1997** from 3 to 5 PM. Tickets are \$35.00 each and include a complete prepaid, two-hour open bar, hors d'oeuvres, buffet, and dessert. Spouses and guests are welcome. We are limited to 90 attendees, so please make your reservations early.

Reservations are required by April 30, 1997. Complete the reservation form and return it with your payment. If you would like tickets mailed back to you, please enclose a self-addressed stamped envelope. Otherwise, your tickets will be held at the door for you. If any additional information is required concerning the reception, contact Anne Giedlinski at (201) 377-3175.

Use this form for Reception reservations. **ENCLOSE A SELF-ADDRESSED STAMPED ENVELOPE to receive tickets in advance.** Reservations are required by April 30, 1997. Mail reservation request to:

Anne Giedlinski
299 Brooklake Road
Florham Park, NJ 07932

Enclosed is _____ for _____ ticket(s) at \$35.00 each (make check payable to **North Jersey Section IEEE**) for:

NAME: _____

ADDRESS: _____

E-mail Addresses

The IEEE needs your e-mail address to promote more efficient communication and reduce mailing costs. Currently only about 30% of North Jersey Section members have provided them. You can provide your e-mail address through one of the following:

World Wide Web:
http://www.ieee.org/mem_serv/changeaddr.html
email: address.change@ieee.org
Mail: IEEE 445 Hoes Lane
PO Box 1331
Piscataway, NJ 08855-1331

Phone: (800) 678-IEEE
Fax: (908) 981-9667

Calling All Leprechauns! GOLD on Deck!

The next meeting of the G.O.L.D. (Graduates of the Last Decade) shall be on Friday, March 21. Plan to be at Houlihan's in Secaucus for happy hour starting at 6:30 PM. If anyone needs directions, or has questions, contact Amy Galarowicz at a.e.galarowicz@ieee.org or by phone at work at (201) 818-3740. Looking forward to seeing everyone there!

Bandwidth Enhancement in Microstrip Antennas and Phased Arrays

The topic at the March 19, 1997 meeting of the IEEE NJ Section MTT/S/AP-S Chapter will be "Bandwidth Enhancement in Microstrip Antennas and Phased Arrays". The speaker will be Dr. C.P. Nehra.

About The Talk

Microstrip antennas and microstrip arrays have gained in popularity because of low cost, low profile, low weight, conformability and ease of manufacture. Disadvantages of the microstrip antennas are: limited power capacity, poor polarization purity and spurious feed radiation. Probably the most significant disadvantage is their narrow bandwidth. Hence a significant effort has been expended to come up with schemes for bandwidth enhancement. These schemes classify into those that do not alter the radiating element and those that do. In the former case, bandwidth improvement is achieved by broadband impedance matching or simply broadbanding, in the latter case by increasing its volume, stagger tuning and double tuning. Of the latter schemes increasing the volume is the simplest, stagger tuning the most popular, double tuning (by the addition of parasitic resonant elements) a distant third.

Following a review of bandwidth improvement methods, a systematic design procedure for double tuning of a microstrip strip-element for phased array applications will be presented. Salient features of this method are, i) double tuning is achieved by proper choice of the element parameters, and ii) bandwidth is a design parameter in its own right which ensures that bandwidth requirements will be met. Numerical results will be presented.

Time: 7:00 PM, Wednesday, March 19, 1997. Free Buffet will be starting at 6:15 PM.

Place: NJIT, Room C305, Newark, NJ.

Information: Dr. Chandra Gupta (201) 633-4469 (GEC-Marconi); Willie Schmidt (201) 492-0371; Dr. Arthur Paoletta (908) 427-2825 (US CECOM).

North Jersey Section Activities March 1997

March 5—"NJ Section Executive Committee Meeting" – 7:00 PM, Plant 11, GEC-Marconi, 164 Totowa, NJ. Alan Stolpen (201) 822-1300, ext. 2416.

March 13—"Market Outlook-First Quarter 1997" – NJ Section PACE, 6:15 PM, Clifton Public Library, 292 Piaget Ave., Clifton, NJ. Dr. Robert Sinusas (201) 228-3941.

March 19—"IEEE Sarnoff Symposium 1997 - Advances in Wired and Wireless Communications" – 8:30 AM - 5:30 PM, The College of New Jersey (Trenton State College), Hillwood Lakes, Trenton, NJ. For further information contact Mrs. Kalada, Engineering Department, TCNJ (609) 771-2779.

March 19—"Bandwidth Enhancement in Microstrip Antennas and Phased Arrays" – MTT/S/AP-S Chapter, 7:00 PM, Room C305, NJIT, Newark, NJ. Dr. Chandra Gupta (201) 633-4469 (GEC-Marconi).

March 20—"Electric Vehicle Technology" – NJ IAS/PES Chapters, 7:00 PM, GPU Energy, 300 Madison Ave., Morristown, NJ. Ken Oexle (201) 386-1156.

March 21—"Calling All Leprechauns! GOLD on Deck!" – IEEE Graduates of the Last Decade (GOLD), 6:30 PM, Houlihan's in Secaucus, NJ. Amy Galarowicz (201) 818-3740.

March 25—"Cellular Interference Management For Integrated Services Over CDMA"—7:30 PM, Fairleigh Dickinson University, River Road and Route 4, Teaneck, NJ, Muscarelle Building (room to be determined). Mel Lewis (914) 968-2500, ext. 2304 or Art Greenberg (201) 492-1207.

March 25—"Coincidence Hybrid Single Photon Emission Computed Tomography and Positron Emission Tomography (SPECT/PET) Scintigraphy"—NY/NJ/LI EMBS, 6:30 PM, New York Academy of Medicine, Fifth Avenue at 103rd Street, New York, NY. For further information contact Office of Medical Education, New York Academy of Medicine (212) 822-7273.

Upcoming Meetings

April 5—"NJ Section Executive Committee Meeting" – 7:00 PM, Plant 11, GEC-Marconi, 164 Totowa, NJ. Alan Stolpen (201) 822-1300, ext. 2416.

April 17—"Review and Update of the 1996 National Electrical Code (NEC)"—NJ IAS/PES Chapters, 7:00 PM, GPU Energy, 300 Madison Ave., Morristown, NJ. Ken Oexle (201) 386-1156 (see details in April Newsletter).

May 4—"NJ Section Awards Reception"—3:00 to 5:00 PM at the Birchwood Manor, 111 North Jefferson Road, Whippany, NJ. Anne Giedlinski (201) 377-3175.

May 22—"92nd Semi-Annual Seminar - INTRANETS"—NY Communications Society, 9:00 AM to 4:30 PM, United Engineering Center, 345 47th Street, New York, NY. Jim Barbera at j.p.barbera@ieee.org or by fax at (212) 465-8877.

Members and Non-Members Welcome PLEASE POST

NY/NJ/LI EMBS:

Coincidence Hybrid SPECT / PET Scintigraphy

On Tuesday, March 25, 1997, the Metropolitan Chapter of the Engineering in Medicine and Biology Society of the Institute of Electrical and Electronics Engineers together with the New York Academy of Medicine's Sections on Nuclear Medicine and Biomedical Engineering will host a program on "Coincidence Hybrid Single Photon Emission Computed Tomography and Positron Emission Tomography (SPECT/PET) Scintigraphy". The speaker will be Dr. Martin P. Sandler.

About The Talk

Positron emission tomography (PET) and single photon emission computed tomography (SPECT) are medical imaging technologies that enable generation of two dimensional (2-D) images of the physiological functional states of organs and tissues in the human body. PET and SPECT technologies have assumed important roles in metabolic mapping and characterization of receptor binding in the brain, in measurement of the level and extent of cardiac perfusion for assessment of surgical intervention, and in oncological metabolic mapping of tumors. In PET and SPECT imaging, radio-isotope pharmaceuticals with known properties (and physiological affinities) are administered to patients, and the photons subsequently emitted by the isotopes taken up by the targeted organs and tissues are detected with specialized cameras. PET cameras typically consist of collimators tied to crystal scintillators, which interface to photomultipliers and associated electronics for determination of the numbers and relative spatial distributions of the photons emitted by the absorbed radio-pharmaceuticals. 2-D histograms of the detected photons' distributions are computed and used to create images whose brightness/colors are indicative of the functional states of the organs/tissues scanned. The images generated are 2-D projections, so PET scans of organs and tissues deep in the body are susceptible to degradation from radioactive "noise" in tissues in front of and behind the organs/tissues of interest. In addition, PET signal amplitude is frequently attenuated because of photon absorption and/or scattering in intervening tissues. SPECT techniques utilizing a rotating gamma camera, and incorporating compensation circuitry for signal attenuation in intervening tissues overcome some of these problems. PET and SPECT technologies, however, still

afford relatively low sensitivities and limited resolutions. In addition, the radio-pharmaceuticals most frequently utilized in PET and SPECT imaging incorporate relatively heavy isotopes, that do not occur naturally in biological molecules. As a consequence, development of a range of physiologically useful tracers incorporating these isotopes has proven difficult. The very short half life (typically 2 to 110 minutes) of most of these isotopes, has also necessitated that an on site cyclotron be available for preparation of the required radio-pharmaceuticals. This has greatly limited availability of the technology and kept its costs relatively high.

Dr. Sandler shall discuss the state of the art of SPECT and PET technologies. He shall discuss new developments in scintigraphic camera design, and will describe in detail the new dual isotope/dual head scintigraphic cameras used in coincident hybrid SPECT/PET imaging. He shall present examples of clinical applications of coincident hybrid SPECT/PET imaging in brain, cardiac, and oncological imaging. Future developments and directions for research in the field shall also be discussed.

About the Speaker

Dr. Martin P. Sandler is currently Professor and Vice Chairman of the Department of Radiology and Radiological Sciences, and Chief of Nuclear Medicine at Vanderbilt University Medical Center, Nashville, TN. He received his MD from the University of Cape Town, South Africa in 1972. He completed his residency in Internal Medicine, and held fellowships in Endocrinology and Nuclear Medicine, at Vanderbilt University. Over the past 20 years Dr. Sandler has made significant contributions in the enhancement of scintigraphic camera and instrumentation design. He has co-authored five text books, written 80 peer reviewed articles, and multiple book chapters and scientific abstracts on high energy nuclear medical imaging. His research interests include high energy nuclear medical imaging using both collimated and coincidence techniques. His hobbies include classical music, opera, and long distance running.

Pre-Meeting Reception

A reception with refreshments prior to the meeting will be held at the New York Academy of Medicine starting at 6:00 PM.

Voluntary contributions are requested. No reservations are necessary.

Time: Program 6:30 PM, Tuesday, March 25, 1997 (6:00 PM reception).

Place: New York Academy of Medicine, Fifth Avenue at 103rd Street, New York, NY (Limited free parking in NYAM enclosed lot at 2 East 103rd Street).

Further Information: Office of Medical Education, New York Academy of Medicine (212) 822-7273.

NJ Section PACE:

Market Outlook-First Quarter 1997

At the March 13, 1997 meeting of the NJ Section's Professional Activities Committee for Engineers, the topic will be "Market Outlook-First Quarter 1997". The speakers will be Edward Landau.

About The Talk

Market Outlook is an educational seminar prepared by the investment experts at American Express Financial Advisors.

You can find out what's happening in the world's stock and bond markets - and how to take advantage of them. You can learn where our financial managers see opportunity and how you can take advantage of the ideas you hear: what strategy makes sense when the markets are at all-time highs; how low inflation affects your investment plan; where to look for attractive values in any environment.

As an added bonus for attending the PACE meeting, we will be holding a drawing for attendees for free books on financial planning and investing.

About The Speakers

Mr. Landau is a Personal Financial Advisor with American Express and holds the designation of Certified Financial Planner. He is licensed by the National Association of Securities Dealers. Mr. Landau specializes in personal financial planning, including retirement and investment planning. Before becoming a Financial Advisor, Mr. Landau, spent over twenty years as an RF Design Engineer, Consultant and Engineering Manager.

Time: 6:15 PM, Thursday, March 13, 1997. Free refreshments will be provided.

Place: Clifton Public Library, 292 Piaget Ave., Clifton, NJ, (201) 772-5500 or see Newsletter web page.

Information: Dr. Robert Sinusas (201) 228-3941.