

ОБІЖНИК - NEWSLETTER

ТОВАРИСТВО УКРАЇНСЬКИХ ІНЖЕНЕРІВ АМЕРИКИ – НЬО ЙОРК
UKRAINIAN ENGINEERS' SOCIETY OF AMERICA – NEW YORK BRANCH



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From the President's Desk

The recent few weeks have been slow on UESA chapter and member news as we move thru the annual summer doldrums. I'd also like to apologize for the lateness of this issue. Although things have been slow on the Society news front, the Board members professional schedules have been packed and as a result the production of the newsletter was delayed.

In this issue we finally have a write-up on the incredibly interesting lecture presented by Dr. Lubomyr T. Romankiw. He's essentially the father of one of the key components of modern computers. It is impressive to know that we have such notable inventors in our Ukrainian community.

Next, the New York City chapter has finally become a member of the Practicing Institute of Engineering. This means that we will be able to begin offering some form of continuing education classes.

As always, please do not forget that our local newsletter, the web site and the national newsletter are always looking for stories on the professional and personal accomplishments and events. Please send it in so that we may share it with our fellow members.

Next, I'd like to remind our members one more time about membership dues. **If you have not already done so, please do not forget to send in payment for your membership dues.** Full members pay \$35, retired members pay \$20 and student members pay \$15 per year. We are rapidly approaching the point where non-paying members will be labeled as "inactive" members and will stop receiving mailings etc.

Until next time.....

Marco Shmerlykowsky, PE
Марко Шмериковський

Dr. Lubomyr T. Romankiw Lectures on "Magnetic Hard Disc Storage Past, Present and Future"

By Ivan Durbak

On June 2nd, 2004, the Ukrainian Engineers' Society of NYC presented a lecture by Dr. Lubomyr T. Romankiw, noted research scientist and IBM Fellow at IBM T.J. Watson Research Center, Yorktown Heights, N. Y., at the Ukrainian Institute on East 79th Street, New York City, on "Magnetic Hard Disc Storage Past, Present And Future".



Dr. Lubomyr T. Romankiw

Don't forget to pay your membership dues



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Dr. Romankiw started with an overview of the entire computer disk technology, history and environment. He then provided a detailed description of plating through mask technology used in thin film heads in magnetic storage, which he pioneered several decades ago. Dr. Romankiw originally conceived and developed, and has since updated, the entire fabrication process, which to this day, is the basis for manufacturing of magnetic storage heads around the world. Every PC in the world today typically houses a magnetic disk based directly on the work of Dr. Romankiw: as one of the audience suggested, just as each PC typically shows a sign "Intel Inside" for the CPU chips, there should perhaps be a similar indicator on each PC showing "Dr. Romankiw Inside" for the hard disk.

Dr. Romankiw described how the original hard disk drive, RAMAC 305, introduced by IBM in 1957, had an areal density of 2,000 bits/inch square and used copper wire hand wound ferrite cores as read-write heads. Today commercial systems approach storage density of 100 Gigabits/sq. In laboratory tests heads capable of 150 Gigabits/sq. in. are being investigated, a density once thought to be unattainable. This represents eight orders of magnitude increase in areal density in 47 years. Four orders of magnitude of this jump was achieved since commercial introduction by IBM, of the inductive, multi turn, batch fabricated thin film heads in 1979. Since introduction of the first thin film heads the cost of storage has dropped four orders of magnitude, the data rate has increased several orders of magnitude. This has had a significant effect on enabling the desk and lap-top computers, data mining and Internet. Data stored half way around the world are found, analyzed, and results delivered, through high speed interconnections, in fractions of seconds.



Dr. Romankiw discussing the process by which a computer hard disk works

Dr. Romankiw presented the technology which was originally invented at the T. J Watson Research Center of IBM in Yorktown Height, NY and which was developed jointly with IBM San Jose, CA into a commercial process used today to manufacture thin film heads throughout the world. Since the invention of the batch fabrication process for the thin film heads, the magnetic storage has undergone two paradigm shifts. Today we stand on the verge of one more paradigm shift which, while using the fundamental processes developed some 35 years ago, promises to extend magnetic storage density another one to two orders of magnitude. This process, based on electrochemical technology created new era in hard disk storage while at the same time it resulted in a quantum jump for application of electrochemical technology in electronics and MEMS.



Audience members listening to Dr. Romankiw's presentation

Dr. Lubomyr T Romankiw is an IBM Fellow at the IBM's T. J. Watson Research Center, Yorktown Heights, NY, where he has been associated since 1962. He received his early education in Ukraine, his B. Sc in Chem. Eng. from U of Alberta, Edmonton, Canada in 1957, and his M. Sc. and Ph.D. degrees in Metallurgy and Materials from MIT in 1962. He holds 57 patents, has over 120 published inventions, published more than 150 scientific papers, six book chapters and has edited ten volumes of symposia proceedings in the areas of: (1) Magnetic Materials, Processes and Devices; and (2) Electrochemistry in Electronics. His research has dealt with nearly all aspects of electroless plating, electroplating, etching, lithography and micro-fabrication used in electronics. He pioneered plating through mask technology used in thin film heads in magnetic storage, and conceived and developed the entire fabrication process, which to this day, is the basis for manufacturing of magnetic storage heads around the world. He developed an entirely new approach to use of lithography and micro-fabrication techniques, applied them to

magnetic head fabrication and then extended them to X-ray lithography mask fabrication, plating of thin film chip carriers, C-4 interconnects, and to copper metallization of silicon chips.

Dr. Romankiw is very active in the Electrochemical Society and AESF. Has organized ten major scientific symposia. He is a member of ECS, ISE, AESF, IEEE, SPIE, Shevchenko Sci. Soc., Ukrainian Eng. Soc., and the Engineering Academy of Ukraine. He is ECS Fellow, IEEE Fellow, IBM Fellow, and an Honorary member of the ECS and of the Shevchenko Scientific Society .He shared ECS Research Award for his invention of laser enhanced plating. He holds many IBM, US National and International Outstanding Invention and Contribution Awards For his seminal contributions to magnetic storage technologies Dr. Romankiw received one of the highest honors of ECS, the Vittoria de Nora Medal of the ECS in 1994, one of the highest honors of the IEEE, the Morris A. Lieberman Award and he was named an IEEE Fellow in 1996. "For his major contributions to science, technology and in particular for demonstrating manufacturing worthy processes which created a \$7 billion dollar thin film head industry", he was awarded in 1993 the highest honor of the Societies of Chemical Industries the PERKIN GOLD MEDAL.

Throughout this presentation, Dr. Romankiw kept the audience engaged and involved with a balance of highly technical material and practical real-world problem examples, and especially with his enthusiasm and excitement still evident after four decades of cutting-edge research on this topic.

The evening finished with informal and convivial discussions over food and drinks.

This was the fifth in a series of engineering & scientific lectures presented by the Ukrainian Engineers' Society of NYC during the 2003/2004 year. Next year there are plans for another series of informative and high-caliber lectures to be presented; schedule will be posted shortly.

To receive announcements about these and other UESA events send a blank e-mail to: uesa-event-subscribe@yahoogroups.com

UESA-NYC Joins the Practicing Institute of Engineering

The Practicing Institute of Engineering was originally former in 1980 by the New York State Society of Professional Engineers. Although there were a few initial successes, PIE found it was unable to attract

enough attendees to its sessions to be cost effective and the programs were no longer offered. After years of dormancy PIE was reactivated in 1993.

The organization's stated purpose is to "offer courses of instruction, lectures and seminars for members of the engineering profession....to the end that the practice of engineering may be conducted with that continuing competence, moral integrity and breadth of understanding which will enhance the usefulness of the profession to the community and to promote the continuing professional development of engineering by the award of appropriate continuing professional development credits...."

As a member of PIE, the New York City Chapter of UESA will be able to apply to have its lectures qualify for the NYS continuing education credits required for the renewal of professional engineering licenses. It also allows the Chapter to get additional publicity for its lecture series since pre-approved lectures and courses will be listed on the organizations web site.

For additional information on the Practicing Institute of Engineering, members are encouraged to browse the organizations web site at the following address:

<http://www.pie-cpc.org>

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Keep Us Informed!!!

Please send news items, articles, information about our members and other interesting information to the following address:

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