

TIA Meeting for Saturday, June 20, 2009.

Location - the 2020 Building in the Oak Ridge Industrial Park. Time 10AM till Noon.
Visitors are always welcome.

Forthcoming Meeting

Title: Passive Microwave Fire Detection by Professor David Icové

Abstract: The science of using passive microwave engineering technologies in detecting both flaming and smoldering fires has been shown as a promising technique. The invention to be discussed relies upon the fact that thermal radiation from fires generates a detectable signal in the microwave portion of the electromagnetic spectrum and that it can penetrate optically thick smoke and water vapor.

Vitae: An internationally recognized forensic expert, Dr. Icové is coauthor of several leading textbooks in forensic fire engineering investigations. Since 1992, he has been a principal member of the NFPA 921 Technical Committee on Fire and Explosion Investigations. A retired career Federal law enforcement agent, Dr. Icové has served over his career as a criminal investigator on the federal, state, and local levels.

Dr. Icové holds B.S. and M.S. degrees in Electrical Engineering and a Ph.D. in Engineering Science and Mechanics from The University of Tennessee. He also holds a B.S. degree in Fire Protection Engineering from the University of Maryland-College Park. He is presently Adjunct Assistant Professor in the Department of Electrical Engineering and Computer Science at The University of Tennessee, Knoxville; an Adjunct Faculty member at the Department of Fire Protection Engineering, University of Maryland; and is a Registered Professional Engineer in the States of Tennessee and Virginia.

Meeting Notes from May 16, 2009 Meeting by **Steve Yoder, TIA Recording Secretary**

Tom Kulaga, Vice-President of TIA, opened the meeting. The visitors were welcomed, one set of visitors come in from Chattanooga. **Martin Skinner** brought two of Bill Felknor's artificial snakes. Bill Felknor was last month's speaker who invented the Topsy Turvy® Tomato Planter. The artificial snakes are inflatable plastic snakes that scare birds away from crops, such as cherry trees. Igor Alexeff presented a message about his progress in working with plasma antenna technology. Afterwards, each of the members present were given a moment to discuss their current projects.

Igor Alexeff has been working in plasma and microwave engineering for over 50 years. He has a patent on the Orbitron Microwave Maser that has operated up to one Terahertz (1/3 mm.). He is an author and co – editor of the book, High Power Microwave Sources, published by Artech House. He has spent considerable time recently on plasma stealth antennas, and is listed on several patents issued to the ASI Technology Corporation.

Igor graduated from Harvard in physics in 1952, and received his PhD degree from the University of Wisconsin in nuclear physics in 1959. He also passed the Tennessee State License Exam, and is a registered professional engineer. He has worked at the Westinghouse Research Laboratory on nuclear submarines, at the Oak Ridge National Laboratory in controlled thermonuclear fusion, and at the University of Tennessee in industrial plasma engineering. He has worked overseas for extended periods in Switzerland, Japan, India, South Africa, and Brazil. He has done considerable work for the Institute of Electrical and Electronics Engineers, and was a co – founder of the IEEE Nuclear and Plasma Sciences Society. He was president of that society in 1999 – 2000. He is a Fellow of the IEEE and of The American Physical Society. He has over 100 refereed publications and over 10 patents.

Igor's presentation was the first one to use the TIA's new projector, which provides for presentations from software run on a computer, such as Powerpoint®.

Igor began his presentation pointing out that 80% of science is politics. He has known of several worthy inventions that have fallen away from the public due to lack of funding. Igor presented an FM radio that was rigged with a fluorescent light bulb that acted as an antenna. The radio could be tuned to various stations. When the light is on, the free electrons move such that they receive a radio signal. As soon as the light is turned off, the received signal disappears.

The characteristic of being completely turned off allows the antenna to be used in stealth aircraft projects. The antenna can be turned off whenever the aircraft goes into battle so that the antenna is not visible to radar. The next move for Igor's plasma antenna is to enter Phase 3 where an industrial partner joins research and production efforts.

A plasma antenna is a column of ionized gas in which the free electrons emit, absorb, and reflect radio signals just as the free electrons do in a metal antenna.

Benefits of the Plasma Antenna

The plasma antenna is quickly shut off within milliseconds. The antenna is also adjustable in such a way that there is a high frequency shut-off. The

antenna can replace multiple antennas found on a typical battleship. The plasma antenna can be tuned to receive a pre-selected signal.

Igor shared a photo of his plasma antenna that made it to Scientific American. He also shared with us a photo of a plasma switch that a former student of his had built.

Advances in 2009

- Computer controlled intelligent plasma antenna
- Plasma windows can open in microseconds
- Plasma thermal noise can be less than in metal antennas.

The computer controlled plasma antenna consists of an array of fluorescent tubes that are turned on in a specified order. In this way, the plasma antenna “rotates” with great control over speed and direction.

As for thermal noise, Igor pointed out that the Nyquist formula, which would show that hot plasma creates much more noise than a similar metal antenna, is actually wrong when viewed in light of the Ramsauer gases. Argon, the gas used in fluorescent light bulbs, is a Ramsauer gas.

Igor also discussed his patented pulsing drive for plasma antennas. Pulsing the plasma increases its density such that you can achieve a very high power antenna in the order of 2 Million Watts, or enough energy to operate about 2000 homes.

After Igor’s discussion, those present at the meeting were given an opportunity to provide an update on any programs that they are working on. A few of the points made are noted below.

Gordon Campbell pointed out that an expired patent he has on using scent to wake persons up is the basis of technology being developed in Japan. He is also working on a computer program “Grade It.”

Martin Skinner told the group that he was recently on the Pitch-Man program showing off his coil caddy. He is making several prototypes of his flat stock version of the coil caddy.

A visitor, **Michael Glenn Ogden**, told us that he is developing a website for inventors. He currently has grade school children viewing his site, but he is trying to provide a resource for adults as well. He focuses on funny, famous, or wacky inventions.

Tom Kulaga discussed some website improvements that he has been working on. If you haven't taken a look at our website, please go online and see what Tom has done. The website is at www.tninventors.org. He is considering future updates that may include a member sign-on or a member discussion area. We are currently getting over 100 hits per month on the website.

The meeting closed with a discussion about our upcoming **seminar**. The current plans are to use the third Saturday of September for the seminar in lieu of our standard meeting. The seminar will be only a few hours in the afternoon. It was noted that the UT football team will be playing away that weekend.

We are currently interested in scheduling speakers for the event. The theme will be "How to Start and Develop a Business." The idea is to get speakers who can share success stories as well as speakers with knowledge of the rules governing business startups such as taxes and licenses. Please contact a member of the Board of Directors if you have any ideas for speakers. **Bill Felknor**, our outstanding speaker from April, says that he will participate. (Inventor of The **Topsy Turvy**)

Past speaker, Igor Alexeff

