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SPRING 2017

U.S. AIR FORCE TECHNOLOGY TRANSFER PROGRAM

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An installed PS Engineering PMA450A audio panel is shown. The audio panel includes an Air Force multi-talker technology licensed by PS Engineering through a patent licensing agreement. (Photo courtesy of PS Engineering.) See story on page 2.

VIEWPOINT

By Tricia Randall



Tricia Randall
Air Force
Technology Transfer
Specialist

Innovation Discovery Events – A Useful Tool

The Air Force Technology Transfer Program has had an exciting start to the new year featuring Innovation Discovery Events. IDEs provide Air Force scientists and engineers an opportunity to present their inventions and engage in discussions with entrepreneurs and industry experts.

The IDEs are designed to help accelerate, enhance and increase commercialization opportunities by discovering alternative ideas or uses for their inventions. These events have been very successful in helping to enhance our patent applications and helping to protect Air Force intellectual property.

The first IDE of 2017 was held at Air University’s Curtis E. Lemay Wargaming Institute. The event was planned and organized by Department of Defense partnership intermediary, TechLink. As our first national defense-wide partnership intermediary, established in 1999, TechLink has been a consistent innovation partner for the DoD Technology Transfer Program and has brokered or facilitated more than 60 percent of all DoD license agreements over the past nine years.

This IDE was unique because the scientists and engineers received direct input from the warfighter to help identify key capability gaps which help refine the scope of their inventions.

The next IDE is scheduled for 17-18 Apr 17 at Wright Brothers Institute, Dayton OH. We encourage our AF scientists and engineers to consider participating in IDEs as a way to discover alternative uses for their creative innovations.



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This publication provides the Air Force, DoD and other government leadership insight into the valuable contributions that the Air Force Technology Transfer program makes to Air Force research and development activities. It can be found online at www.wpafb.af.mil/t2.

spotlight on INNOVATION

Air Force Agreement Helps Small Business Compete in the General Aviation Industry

By Mindy Cooper, Air Force Technology Transfer Program

WRIGHT-PATTERSON AIR FORCE BASE, Ohio – A patent licensing agreement and cooperative research and development agreement with the Air Force have been major factors in helping one small business directly compete with the largest aviation companies in the industry.

PS Engineering of Lenoir City, Tennessee, signed an exclusive PLA in 2012 with the Air Force Research Laboratory, 711th Human Performance Wing's Human Effectiveness Directorate (711HPW/RH), now known as the Airman Systems Directorate, for a patented speech technology that processes radio signals such that each signal appears to come from a unique location in space when presented over a pilot's headset.

This 'multi-talker' separation greatly enhances communication effectiveness and serves to improve safety during flight operations, according to Dr. Brian Simpson, technical advisor for the 711 HPW/RH Battlespace Acoustics Branch, which developed the technology.

The CRADA allows experts from the Battlespace Acoustics Branch to carry out additional testing and answer questions about the technology while PS Engineering develops and refines products based on technology in the patent.

A CRADA is one type of technology transfer agreement that provides quick access to extensive government-funded research and development resources that can be leveraged to create powerful results while also providing intellectual property protection. Both PLAs and CRADAs are facilitated by the Air Force Technology Transfer Program and its affiliated Office of Research and Technology Applications. An ORTA is embedded at many AF research locations.

"On our own, we didn't have the expertise to develop multi-talker technology," said Mark Scheuer, founder and CEO of PS Engineering. "Being able to interact with Air Force scientists under this CRADA was crucial to our product development. Without these agreements, we would not be leaders in our field."

Since the agreements have been in place, the company has developed a line of products using the technology. As a result, they are able to compete against industry giants. The product line, the PMA450, received FAA certification in 2014. The PMA450A model is the first audio panel of its kind to have graphics displays that use soft keys.

The multi-talker technology spatially separates overlapping radio transmissions received during flight. Instead of the messages coming out at the same time and playing over top of each other, the pilot and flight crew hear distinct messages that seem to come from different locations, making it easier to decipher messages and react.

PS Engineering competes in the commercial aviation aftermarket industry, serving companies like Honeywell and Avidyne Avionics. Many of its products are compatible with an aircraft's original equipment manufactured by Garmin Ltd.

"Using a PLA with a follow-on CRADA allows a company to leverage both Air Force resources and the inventor's knowledge. It helps to further develop the licensed technology for the company's specific commercial application. In return, the Air Force obtains additional data and a commercial product is more likely to result from the agreements," said Dr. James Kearns, 711HPW Technology Transfer and Domestic Alliances manager.

For more information about technology transfer opportunities with the Air Force, call the Air Force Technology Transfer Program Office at 937-904-9830.

Dr. Loon-Seng Tan

Principal Research Chemist

Air Force Research Laboratory, Materials and Manufacturing Directorate, AFRL/RXAS



What is your current field of study and what drew you to that field?

My current field of study is organic materials chemistry, which in my working definition, covers the chemistries of both small organic molecules and synthetic macromolecules (polymers) as well as organic-inorganic hybrid materials. While the usefulness of these materials in terms of properties, functionality, processibility, and scalability are certainly important with respect to the missions and applications of interest to the Air Force, how I can utilize the synthetic tools available to me to create or modify molecular structures that can lead to specific functions and properties is probably the main reason I was drawn to the field.

You have completed 80 patents during the course of your career with AFRL. Why do you pursue patents?

As an AFRL scientist, I understand that I have a duty and obligation to protect intellectual properties that are developed during the course of my work. This immediately occurred to me when I started working in Dr. Fred Arnold's research group in 1983. I've also come to understand that having a suite of patents in an area of technology helps attract potential partner(s) in the industry for technology transfer.

I would like to add that my current and past research colleagues have made important contributions to the "reduction to practice" aspect of these patents. I have been very fortunate to be able to collaborate with many colleagues with expertise in characterization and processing of materials, as well as device fabrication to explore or validate the utility aspect.

Which patents are you the most proud of?

My patents on benzocyclobutene-based polymers are dear to my heart because I conceived the materials concept and worked in the lab to synthesize these materials when I was just starting out in Polymer Branch of the Materials Lab in 1983 as a University of Dayton Research Institute contractor and continued with as an AF civilian in 1987. BCB materials technology was also transitioned to NASA High-Speed Civil Transport Program for evaluation as a candidate matrix for carbon fiber composites in early 1990's. In addition, unbeknownst to us, Dow Chemical and Shell Resins Department were also working on the same chemistry and resins, and both companies later signed licensing options with UDRI. Also, under a subsequent Air Force contract, Dow Chemical developed the key BCB ingredient, and later commercialized Cyclotene®, a liquid BCB-based formulation for microelectronic packaging. So, it is comforting to see the basic science that I was fortunate to be indirectly a part of has led to a commercialized product.

Do you have any patent applications pending?

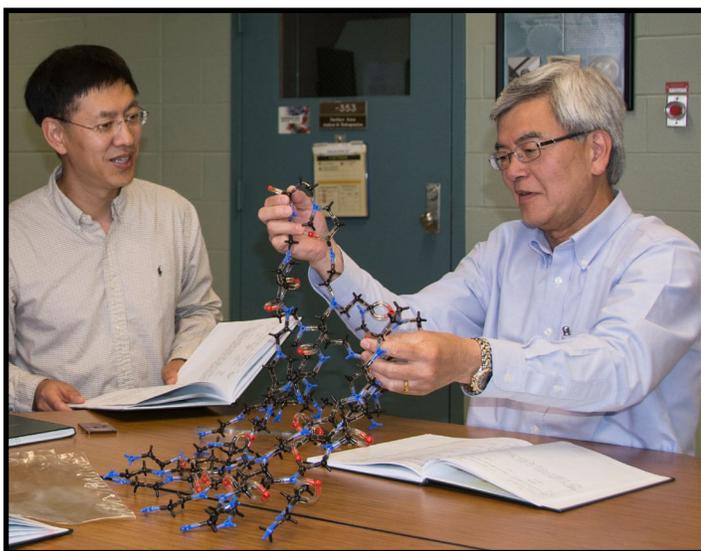
Yes. I have several patent applications and am in the process of writing up a few more invention disclosures.

What do you think is the benefit of pursuing patents to Air Force scientists and engineers?

The potential benefit of monetary reward aside, I think, the most important benefit of pursuing patents is that it provides a way to showcase your originality in scientific thinking and creativity in design and engineering.

What can you say about the patent process to other scientists and researchers?

The patent process can be time-consuming. From my experience, it is important to prepare an invention disclosure that includes a great deal of background information related to the technical issues and challenges of the state-of-the-art. Point out the similarities or distinct differences in the prior art reported in the public domain.



Dr. David Wang (pictured left) and Dr. Tan hold a project discussion in the RXAS Collaboration Space. (courtesy photo)

Meet the Inventor - *Dr. Loon Seng Tan*

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This helps the patent lawyers at AFMCLO/JAZ determine the patentability of the subject matter and put together a technically sound application. Fortunately, there are many efficient search engines (SciFinder, Google Scholar etc.), together with the availability of many science and engineering data bases, this aspect of patent process has become a lot easier nowadays.

Having a close working relationship with the assigned JAZ patent attorney is extremely important when dealing with the patent examiner's initial and final rejections and getting the final allowance. To rebut the objection or rejection, the attorney can help to understand the examiner's perspective and any technical issues. I have been fortunate to have worked with several very competent JAZ patent attorneys.

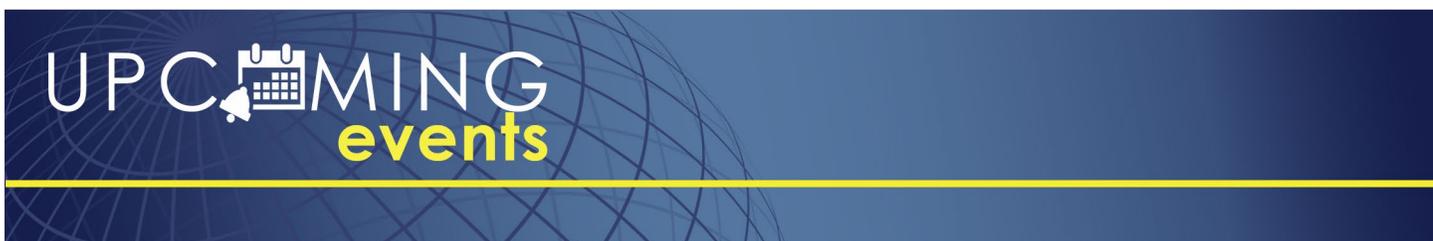


What is your motivation to continue your research?

Materials research is a very dynamic and forward-moving field with challenges and creative solutions popping up constantly. In addition, it is so interdisciplinary that following my curiosity or making up for my ignorance, I always have something new to learn from my colleagues. As an organic/polymer chemist with a bent in creating new and useful compositions, these interactions often-time lead to first paper chemistry, and then working with my synthesis team members to actually create the matter in reaction flasks. Nothing is better than the feeling I get when the results show the synthetic strategy has worked out well (instant gratification) or unexpected results that create a new research direction (more lasting gratification). Of course, I have had my share of ideas that didn't pan out. But, the important thing is to spend some time to think about why it did not work, the understanding may come in handy down the road. Last but not least, having a small team of dedicated synthetic chemists working with me helps me to keep moving!

What advice can you give other scientists and engineers when it comes to patenting an idea/invention/method?

As AFRL scientists and engineers, we have a duty and obligation to protect intellectual properties developed in the course of our pursuit of scientific knowledge and discovery. Patentable ideas and concepts do not have to be revolutionary. Your idea/invention/method needs to fit the basic criteria for a meaningful patent: (i) novelty or new and improved over state-of-the-art (ii) utility or potential applications, and (iii) non-obviousness to the practitioners in the field. To cover all three aspects, it is very important to do your homework with respect to the state-of-the-art in both open and patent literatures. I have been very fortunate to have worked with a number of outstanding Air Force patent lawyers who have provided invaluable guidance with respect to patentability and tremendous help in formulating the final applications. I'm sure the Air Force patents lawyers will be very helpful to any S&E interested in patenting their inventions.



Conferences, workshops and exhibitions of interest to T2 personnel and program participants

Federal Laboratory Consortium National Meeting

25-27 April | San Antonio, TX

DoD T3W

10-13 July | Austin, TX

TechConnect World Innovation

14-17 May | Washington DC

FLC Midwest and Southeast Regional Meeting

29-30 August | Cincinnati, OH

Air Force Annual Tech Transfer Meeting

20-21 June | Arlington, VA

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