



AIR FORCE MATERIALS AND MANUFACTURING ALUMNI ASSOCIATION (AFMMAA) NEWSLETTER

TWENTY NINTH EDITION

FALL 2018 - WINTER 2019

MEET THE NEW RX DIRECTOR

Greetings to all! I'm humbled and honored to be writing this as RX Director. When I was appointed to the position back in October it was like returning to family. Okay, it's a rather unique family: one full of incredibly talented and dedicated civilians and military and contractors; scientists and engineers, mission support and administrative professionals, etc. But it's family nonetheless. I have shared with many of you that the reason I'm even in AFRL today is because of the experience I had as a member of the Materials and Manufacturing Directorate back in the early 2000s. Just being around such great people solving hard and important problems for our Air Force is, well, frankly a bit of a rush.



Mr. Timothy Sakulich

I have spent my first three months getting up to speed on the numerous important programs and capabilities in RX, connecting with customers and stakeholders, and working to focus my energies to greatest effect for the Directorate's continued success. The National Defense Strategy published last year makes it clear that that our nation faces strategic challenges that demand new urgency and bold innovation in science and technology. To that end, you may have heard that the Secretary of the Air Force commissioned an AF S&T 2030 study with the express goal of ensuring our airmen will have the dominant warfighting edge through 2030 and beyond. At the time of this writing, a new AF S&T strategy is undergoing edits for the Secretary's approval. Meanwhile, the AFRL Commander, Maj Gen Cooley, has asked me to play a key role in leading its implementation. I look forward to sharing more with you as AFRL and RX move forward with that.

In the end, it is people who invent the future AF that our children and grandchildren will serve in. It is people who innovate solutions to today's unexpected challenges on the battlefield, the flightline and the manufacturing line. It is people who provide the inspiration, teamwork, agility

and good old fashioned "can do" grit to confidently meet any challenge that may be ahead. It is people who put the AF core values—integrity, service and excellence—into action. And I see all of that every day in RX. Moreover, the very existence of the AFMMAA reflects the service, camaraderie, and heritage that is core to who we are, and I thank you for helping to keep that spirit alive!

*Mr. Timothy Sakulich
Director, Materials and
Manufacturing Directorate*

AFMMAA PRESIDENT'S MESSAGE

Happy New Year Alumni! WOW! Did 2018 fly by as fast for you as it did for me? After Spring, the holidays seemed to come so fast it was unbelievable! Hopefully all had joyful celebrations with family and friends and as we embrace 2019 here's my wish for happiness, health, and prosperity to each and every one!



**Matt Di Biase
AFMMAA
President**

This issue of our Newsletter welcomes returning Alumni, Mr. Tim Sakulich (aka Col. Sakulich - RX Deputy Director (2003-2004)/ Director (2005-2006) as we ALL congratulate him on his selection to the Senior Executive Service and RX's 'new' Director. Three Cheers!!! The AFMMAA looks forward to his Directorate leadership as we extend our continued support to the organization and its mission. We also THANK Col. Chuck Ormsby for his outstanding military service and Association support as he embarks on the next phase of his professional endeavors! The AFMMAA wishes the best to he and family and relishes the idea of future interactions!

Established in 2000, the AFMMAA is celebrating its 19th year! As you know, we're AFRL's only Alumni association and something to take pride in. Our Newsletter is an important Alumni outreach, keeping those near and far connected and abreast of what's going on. That said, AFMMAA's voluntary membership, the Alumni family, is the 'life blood' of the Association. As I've said, and will continue to say, AFMMAA would not exist if not for

(Continued on Page 2)

(AFMMAA President's Message continued)

your continued membership, contributions, and voluntary efforts – Thank You! Your Executive Board is reviewing the prospect of updating the Annual Membership and Lifetime Membership dues structure for economic and administrative pressures. A modest increase is warranted as the rate has been unchanged since establishing. Proposed changes will be presented at the 20 June 2019 semi-annual meeting to be held at the Dayton Engineers Club. So, take advantage of the current rates when the dues letters go out and even consider converting to Lifetime Membership.

If you recall, in the Spring Newsletter edition, we announced some AFMMAA position transitions. We welcomed Tobey Cordell as the new Editor in Chief for the Alumni Newsletter....well, with this edition, Tobey has decided to pass the editor's baton as he and his wife have left the Dayton area for New Orleans to be close to children and grandchildren. Once again Tobey, sincere THANKS for all you have contributed to the RX community professionally and as a pivotal Alumni leader/contributor. We'll miss your hands-on support! With Neal

Ontko, Vice-President for Membership, and Dr. Jim Malas, Scholarship Committee Chairman, both deciding to open up their positions for others to serve, Roland Watts and Dr. Hal Gegel have graciously volunteered their time and service for the respective positions! The Alumni pass on their sincere thanks and appreciation to Neal and Dr. Malas for their AFMMAA service and commend both Roland and Dr. Gegel for their willingness to assume positional roles/responsibilities!

Alumni volunteerism is essential to the AFMMAA and the Association welcomes your participation. Get involved in your AFMMAA!

The upcoming June meeting will hold the biennially elections for officers; President, Executive Vice President, Vice President for Membership, Secretary, and Treasurer. Ballots will be circulated, collected/tabulated and the results presented at the end of the meeting. Don't forget to Save the Date, for the AFMMAA Semi-Annual Meeting at the Dayton Engineers Club, 20 June 2019!!!

*Personal regards,
Matt Di Biase
 AFMMAA President*

**WHO IS THE AFMMAA
 (JANUARY 2019)**

<u>Function</u>	<u>Value</u>	<u>Who Cares</u>
> Monthly Luncheons	Fellowship	- A Few Regulars: Current RX & Alumni - Some Pleasant Surprises: From time to time, new 'old' faces
> Annual Engineers Club Meeting	Fellowship 'Content' Agenda	- Many Regulars - Directorate Leadership and interest - Some Pleasant Surprises: From time to time, out of town and local members
> Newsletter	Alumini & RX People Highlights Happenings & Updates	- All the above - High interest for Alumni and current RX Team
> Web Site & ML History	ML History: Legacy/Heritage/People	- High interest for Alumni and current RX Team - Need more contributors
> Scholarships	Alumni Recognition of RX Employees Highly Visibility for Alumni	- RX Family and Alumni contributions

THE AIR FORCE MATERIALS AND MANUFACTURING LIVING HISTORY

The banner message for the alumni going forward is to *please provide additional ‘original source’ material* for our alumni web site history page: <https://www.afmmaa.org>. The site is open for new inputs as a living history project and will remain so, but you are the most important original sources. We now have an easy way on the site for you to make inputs, and we have a good start on a framework to keep things organized and readily available for you to look at, use and enjoy.

Your motivation to contribute may be simply to recall and share important memories with old friends. So far many have found this rewarding. Beyond that, however, you may be surprised how important even tidbits of information can be to help create a credible history of ML. A favorite picture contains unique information about specific individuals, perhaps about specific projects and a specific time period. Other information such as documents, personal recollections and reflections on your personal chapters of ML history is equally valuable.

Please take a look at some of the documentation we are collecting or are referencing directly on the site. For example, the AF technology/engineering history documentation produced in connection with the WP 2017 centennial year, and the 2003 centennial of powered flight.

While we can all be appreciative of the initiatives of the historians to produce this documentation, our web site provides an opportunity to improve the accuracy and completeness of the material. When important things are missing, an opportunity is lost. New original source inputs can make all the difference in the world for the historical record. As noted in earlier newsletters, the idea for our site is along the lines of the Wikipedia model: start with true, accurate and important things, even very small ones; build and add to these; make the material available to others, especially historians.

We continue to post information from contributors, and we are taking action to tell others about our work: the National Aviation Heritage Alliance, Corporate AFRL, the Wright Brothers Institute, Corporate AFLCMC and others.

Mr. Tim Sakulich is now on board as director at RX, and our alumni president, Matt, met with him recently and has gained his enthusiastic endorsement for our joint ML/RX history work. Tim is encouraging the current directorate staff to join in – they are important ‘original sources’ as well.

We are open for business, so join in!! (per Dr. Merrill Minges and Dr. Terry Ronald)

NEAR TERM OPPORTUNITY!!

The initial ‘100 Days of RX’ booklet has been a best seller with the alumni. Many copies of this booklet have been distributed with very positive responses from those who have seen it. The Directorate plans to edit, complete and print the booklet in the next few months making copies of the final edition available to all. Alumni inputs are requested!! (per Dr. Merrill Minges and Dr. Terry Ronald)

REMINDER ON RECENT MEMBER INFORMATION

During the year many of our members have provided comments for the AFMMAA Newsletter and website regarding their current activities and interests. We did not receive comments for this edition of the Newsletter. We would like to hear from you! Please use the Membership and Scholarship Donation Form, Recent Information About Yourselves, or email to AFMMAA attention of Roland Watts, Membership Chairman, at rolandjw@zoomtown.com.

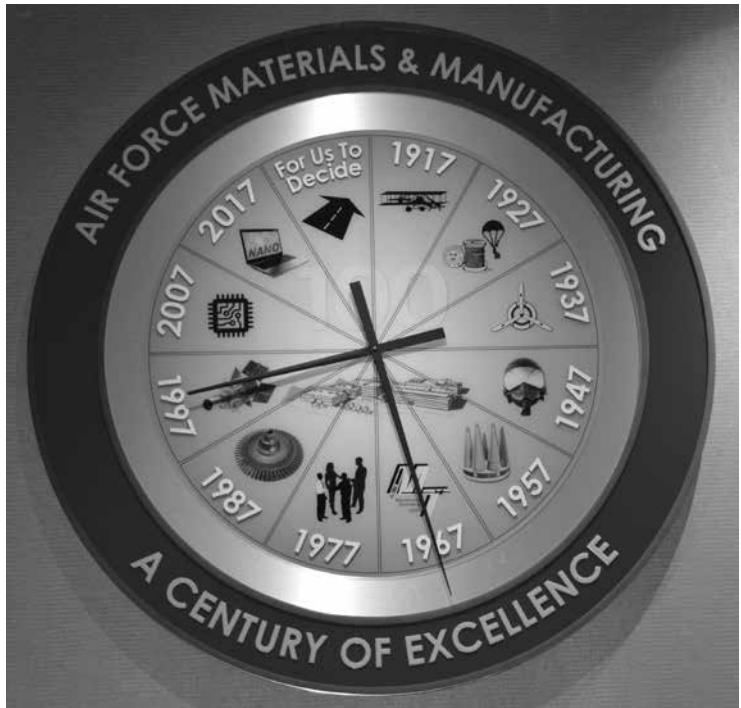
CALENDAR UPDATE

Semi-Annual AFMMAA Winter Business and Member Meeting at the Hope Hotel, Thursday 17 January 2019 – WPAFB 0900-1100

There is no charge for this event. Coffee and water will be provided. After the meeting, the attendees are encouraged to attend the RX Awards luncheon starting at 1130, also in the Hope Hotel. Reservations are not required, but please notify Matt Di Biase (mattdibiase75@gmail.com) of your attendance.

THE MATERIALS AND MANUFACTURING CENTENNIAL CLOCK AND THE DIGITAL GATEWAY TO DIRECTORATE HISTORY

In October after more than a year of joint effort between RX and RX alumni the completed Centennial Clock was mounted for display in the B 653 main lobby of the directorate. As noted in the Spring 2018 AFMMAA newsletter, a number of joint working group meetings and discussions were conducted to translate the vision of the centennial moment's pause reflecting on the legacy and heritage into a representative attractive physical display of 100 years of Materials Laboratory accomplishment.



Also in the main lobby near the mounted clock are copies of the Centennial Brochure which briefly describes the individual iconic features of the clock. The brochure is a memento available for all who may be interested.

Equally important, the clock is in close proximity to the directorate touchscreen monitor system which is a simple, well organized and easy to navigate access portal to a wealth of information on the directorate's past, present and future. The AFMMAA web site, which includes the extensive Materials Laboratory living history being built by the alumni is also directly accessible via the touchscreen. The AFMMAA 'History Page' portal is organized as well along the lines of the centennial clock icon framework.

The alumni extend a special thanks to Mary Shelly, AFRL/RXO for her leadership and tireless energy directing the clock team and to Jeremy Gratsch, director of the RX corporate communications for his advice and support on a number of history projects and the creation and management of the digital gateway. (per Dr. Merrill Minges and Dr. Terry Ronald)

RX PERSONNEL ACHIEVEMENTS

Dr. Jonathan Spowart of AFRL/RX received the Brimacombe Medalist award from The Minerals, Metals & Materials Society for his contributions to materials science and engineering.

Spowart was selected based on his major contributions in the field of materials characterization, which have enabled numerous advances in materials science and engineering. One of Spowart's greatest feats is exemplified by the invention and commissioning of the Robo-Met.3D automated serial sectioning device. The development of this tool enables others in the field to perform their own research into the 3-D microstructure of materials and discover new knowledge that would not have been available otherwise.

"I personally know of no other colleague who shares himself, time, ideas and personal warmth as much as Spowart", said Dr. S. L. Semiatin, an AFRL senior scientist.

The mid-career award recognizes individuals with sustained excellence and achievement in business, technology, education, public policy, or science related to materials science and engineering and with a record of continuing service to the profession.

Spowart said he is thrilled to accept the award. "I am especially appreciative of the team effort and unswerving support of our chain of command, who prioritize excellence in research and development, said Spowart. "AFRL's culture motivates each one of us to achieve greater goals for the Air Force."

Dr. Dhriti Nepal of AFRL/RX was selected to receive the Achievement Award in the Promising Professional category from The Society of Asian Scientists and Engineers.

The Materials and Manufacturing Directorate at Wright-Patterson Air Force Base, Ohio, is the recipient of The Achievement Award highlights top-level talent within organizations. Individuals are nominated based on the criteria that they meet or exceed one of five categories: uniqueness of contributions to the organization, leadership abilities and initiative, professional and/or technical achievements, potential for advancement and social and/or economic value of the development.

Nepal has mentored over 30 junior scientists, students and visiting faculty. She also has numerous collaborations with universities and industry partners. In addition to these accomplishments, Nepal has 12

international patents and 35 publications in high-impact journals such as Composites Science and Technology, Polymer and Chemistry of Materials. She is also an adjunct professor at Wright State University and Miami University in Ohio. Nepal's research team has recently received awards in major international conferences such as Materials Research Society and American Chemical Society.

"I am thrilled and honored to receive this award," said Nepal. "This award is the result of our team effort, and incredible support from our chain of command, an extraordinary Materials and Manufacturing Directorate culture! This culture motivates us every day to achieve a bigger goal and do great things for the Air Force!"

Dr. Matt Dickerson, RXCC, was recently informed of his selection as a 2018 "Laboratory University Collaboration Initiative" LUCI Fellows. These are very competitive OSD awards, linked to the Vannevar Bush Faculty program. The Vannevar Bush Faculty Fellowship program is sponsored by the Basic Research Office, in the Office of the Under Secretary of Defense for Research and Engineering, and administered by the Office of Naval Research. This program seeks outstanding researchers to conduct transformative basic research in topic areas of interest to the DoD.

Only ten from across the service labs are awarded each year and Matt was one of three AFRL selectee's. These are three year, >\$0.5M dollar programs to build in-house technical competency linked to an area of expertise of one the Bush Fellows. Matt will be collaborating with Harvard University for the production of high-temperature resistant and damage-tolerant ceramics. The fellowship is designed to provide the freedom to make scientific breakthroughs, and to bring into AFRL some of the cutting edge techniques being pioneered in the university environment.



COMING EVENTS

Please mark your calendar now for the following AFMMAA and RX coming events. Reservations are required for the AFRL/RX Annual Awards Luncheon on Thursday 17 January 2019. You will be able to register online. The AFMMAA will provide the key information to members by email. Every year we have excellent participation in these events. More events will be announced in the Spring AFMMAA Newsletter

Wednesday 16 January 2019 - AFRL/RX Awards Recognition Ceremony at RX Bldg 653 Cafetorium at 0930. All AFMMAA members are invited. AFMMAA provides refreshments. Point of contact is Andrea Helbach, andrea.helbach@us.af.mil, 937-255-0083.

Thursday 17 January 2019 – Semi-Annual AFMMAA Winter Business and Member Meeting at the Hope Hotel, WPAFB 0900-1100. There is no charge for this event. Coffee and water will be provided. After the meeting, the attendees are encouraged to attend the RX Awards luncheon starting at 1130, also in the Hope Hotel. Reservations are not required, but please notify Matt Di Biase (matt dibiase75@gmail.com) of your attendance.

Thursday 17 January 2019 - Annual AFRL/RX Awards Luncheon at Hope Hotel, WPAFB 1100-1400 hrs. (reservations required on RX website) – Point of contact is Andrea Helbach, andrea.helbach@us.af.mil, 937-255-0083.

THE RX EMBLEM: SYMBOLIC OF OUR DIRECTORATE AND MISSION

The gold circle of arrows projecting outwards signifies the extension of knowledge beyond present boundaries. The three arrows represent materials research, application, and manufacturing technology. The inward pointing arrows portray the extensive efforts contributing to the circle of knowledge. The emblem bears the Air Force colors, gold and ultramarine blue. Against a background of blue, depicting the sky, the primary theatre of the Air Force operations, the central atom represents the building block of all materials.



LUNCHEON SCHEDULE

Please mark your calendar now for the following AFMMAA scheduled luncheons.

19 Dec 2018 - AFMMAA Holiday/Luncheon (Bldg 653) at the NCR Country Club (Weds 1130-1400). Spouses are invited. Please call John to confirm.

17 Jan 2019 - Annual AFRL Awards Luncheon (Hope Hotel, W-PAFB) 1100-1400

16 Jan 2019 - AFMMAA 2018 Scholarship Winners Recognized at RX (Recognition Ceremony (0930 in the Cafetorium))

The monthly luncheons are arranged John Williamson. An RSVP is typically not necessary, but if you think you are coming, it would be helpful so John can let the restaurants know how many tables are needed. Please respond to johnw13@earthlink.com and also let him know where you would like to eat for next years planning! Every year we have excellent participation in these events. Mark your calendar now for these luncheons.

HISTORY OF NDI IN ML AND REMEMBRANCES OF DON FORNEY

In 2017 when the alumni were working with AFRL/RX on Centennial Year documentation, Jim Mattice noted that Don Forney had written a book on the history of NDI/NDE in the Materials Laboratory. Recently Lee Gulley, via John Williamson, provided a link to the full book [<https://apps.dtic.mil/dtic/tr/fulltext/u2/a460631.pdf>] which Terry Ronald has also posted on our history page. This is a very important and impressive 'original source' document including a chapter Don prepared with pictures and names of many of the ML and UDRI NDI teams lead over the years by Tom Cooper, Tobey Cordell and Don. We are putting together some highlights from this book along with remembrances by a number of alumni of Don's years in the Laboratory. Please join in if you like!! The write-up also includes highlights and pictures of the unique experiences Don had as a 12 year old lad at the beginning of WW II; these pictures are posted on the history page as well. (per Merrill Minges)

AFMMAA LUNCHEONS

John Williamson continues his excellent job as the volunteer planner for the AFMMAA monthly luncheons. He keeps providing an ever-changing mix of area restaurants. All the attendees appreciate his hard work. He says the number of alumni attending has ranged from 10 to 22. Please come and join your friends. It's always fun to catch up and reminisce.



From Left to Right: Dick Engman, Dr. Terry Ronald, Dr. Jack Henderson, Bob Rapson, Neal Ontko, Dr. Bob Cochoy, Jim Mattice, Clay Harmsworth, Warren Johnson, Dr. Merrill Minges, John Fenter, and Al Gunderson having fun at one of the AFMMAA Luncheons

SPRING NEWSLETTER STUFFING PARTY

We would like to thank all those who graciously helped with the preparation of the Spring 2018 Newsletter for mailing. Below are pictures of the group that convened at UTC: Warren Johnson, Dr. Terry Ronald, Tom Cooper, Tobey Cordell, Dr. Merrill Minges, Dick Engman, and Bob Rapson. If you would like to be part of this fun in the future please contact Matt Di Biase.



Warren Johnson and Terry Ronald



Tom Cooper, Tobey Cordell, and Merrill Minges



Dick Engman

RECENT MEMBER INFORMATION

During the year many of our members have provided comments for the AFMMAA Newsletter and website regarding their current activities and interests. Here are their recent comments that we received since the Fall 2017 Newsletter. Check Newsletter.

Tobey Cordell, tobeyfl@gmail.com . Recently moved to Metairie, LA to be with our kids. Enjoying New Orleans and watercolor painting and cruising. See you at the annual meeting in June. Joined AFML as 2d Lt in 1964.

Dave Dickson, david.dickson@sbcglobal.net, Retired and enjoying freedom to “goof off” [June 20, 2018]

Robert Gran, rjgran944@roadrunner.com, Retired from Universal Technology Corporation. Departed from RX in 1962.

Lee Gulley, leergulley12@yahoo.com - Working part time with my wife at the Sharon Morse Performing Arts Center here in The Villages, FL. Playing lots of tennis and golf. Entertaining grandkids and participating in some of the 2400 clubs /organizations here.

Anthony “Tony” Jensen, ajensen@innssi.com, Became a new AFMMAA Life Member in Oct 2017. Strategic Business Development; Innovative Scientific Solutions (ISSI); Executive Director & Past President, Defense Planning & Analysis Society (DPAAS).

Brian Kosmal, Just returned from a cruise around the world – 97 days. (New 4/28/18)

Robert Latiff, rlatiff@msn.com, Published new book: “Future War: Preparing for the New Global Battlefield” (Knopf, Sept 17).

John Maguire, johnmaguire@scimssystems.com, Chief Tech Officer Scientific Simulation Systems, Relocating to San Antonio in June 2018.

Merrill Minges, m.minges@sbcglobal.net; I am interested in ML History. He was key in working with Mary Shelley and Jeremy Gratsch, ideas for the Centennial Clock which illustrates the past 100 years in 12 “hours” which represents advancements.

Ted Nicholas, tednicholds@msn.com, We spent 5+ months each winter in Palm Springs.

Som R. Soni, som.soni@zoomtown.com, Retired from AFIT in Dec 2011 as an Associate Professor of Aerospace & Systems Engineering.

John Speers, taffy45431@ameritech.net; Attempting golf. Spent three months in winter near Myers, FL.

Members Centerville Optimist Club.

Roland Watts, rolandjw@200mtown.com, Members of Engineers Club and Kiwanis Order of the Arrow and the new AFMMAA Membership Chairman.

We would like to hear from you! If you wish to share your recent activities or interest with others on the AFMMAA website www.afmmaa.org, please send an email to Roland Watts at rolandjw@200mtown.com

CAREER ACCOMPLISHMENTS EARN PRESIDENTIAL RANK AWARD

This Presidential Rank award is the top award a civilian federal employee can receive and is given by the president of the United States to exemplary federal leaders who have overseen successful federal initiatives with a sweeping impact.

Dr. Daniel B. Miracle was the first scientist in the world to unravel the atomic structure of metallic glasses – a family of alloys used commercially for their exceptional magnetic properties. Potential Department of Defense applications include armor-piercing projectiles and satellite radiation panels – both of which were pursued in a \$30 million Defense Advanced Research Projects Agency initiative.

In addition, extensive worldwide efforts over the past 45 years have exhausted all ideas to increase maximum use temperatures for metal alloys, but in 2010, Dr. Miracle introduced a new family of metal alloys to meet these long-sought goals. These alloys are now being pursued to fill a critical technology gap for the first generation of practical hypersonic munitions, a game-changing Air Force technology.

Note: Dr. Daniel B. Miracle is senior scientists for Nanotechnology at the Air Force Research Laboratory’s Materials and Manufacturing Directorate in Dayton, OH.

COMBINED FEDERAL CAMPAIGN

AFMMAA was a participant in the 2018 Miami Valley Combined Federal Campaign! Thanks to all the Board members that contributed inputs to our application.

RX PERSONNEL ACHIEVEMENT

Bob Ware of AFRL/RXS was selected by the Dayton National Society of Professional Engineers as the Federal Engineer of the Year for 2018. (per George Schmitt)



**AIR FORCE MATERIALS & MANUFACTURING
ALUMNI ASSOCIATION (AFMMAA)**

P.O. Box 341413, Dayton, Ohio 45434-1413

MEMBERSHIP APPLICATION AND SCHOLARSHIP DONATION FORM

Name: _____ Date: _____

Address: _____

City: _____ State: _____ Zip: _____

Telephone -- Home: _____ Work: _____

E-mail: _____ Is E-mail new? _____

Check here if we **CANNOT** release your information, i.e., address or e-mail.

Year departed/retired from RX: _____

RECENT INFORMATION ABOUT YOURSELF (for the website): _____

In what areas would you like to support AFMMAA? _____

Your are invited to join (\$10/yr annual CY 2019 dues), become a Life Member (\$150) and/or make donations to the Alumni Association Scholarship Program.

\$ _____ **Alumni Association Scholarships** (open to students pursuing a degree generally related to the Air Force Science & Technology program, with emphasis on materials sciences, manufacturing technologies or associated management specialities (financial, logistics, administrative, etc).

\$ _____ **Chief Scientist Scholarship** (open to students pursuing an accredited degree in a field of science, math, engineering or technology)

\$ _____ **Annual Membership Dues** (for CY 2019, i.e., 1 Jan - 31 Dec '19) are \$10.

\$ _____ **Lifetime Membership is available for \$150 (one time fee).**

\$ _____ *Total Amount Enclosed

***NOTE: Scholarship contributions and membership dues are tax deductible.**

Membership Category:

_____ **Annual (\$10.00/year)**

_____ **Lifetime (\$150.00 one time fee)**

Make check payable to AFMMAA and send form to:

AFMMAA, P.O. Box 341413, Beavercreek, OH 45434-1413

CENTENNIAL CLOCK BROCHURE



A Century of Innovation... reflecting and inspiring

RX CENTENNIAL CLOCK ICONS

Note: Many programs span over multiple decades. These icons reflect only a small glimpse into the many contributions The Materials and Manufacturing Directorate has made over the past 100-plus years.

1917



SYSTEMS SUPPORT

This icon pays homage to the legacy of Orville and Wilbur Wright and their legendary airplane the Wright B Flyer, developed in Dayton, Ohio. McCook Field was established in 1917 just north of downtown Dayton; its mission rapidly growing in support of the country's entry into WWI and a new era of military aviation. The Army Signal Corps' duties included testing materials for experimental airplanes and developing testing standards. The growing use of metals in aircraft brought new challenges.

An engineering organization was established at McCook Field that included studying metallurgy and foundry practice, textile and rubber technology, organic/inorganic chemistry, and strength of materials. Utilizing wood, textiles, rubber, metallurgy, materials characterization, and non-destructive inspection were all important in the manufacture and testing of aircraft and engines. Forging and casting metal products and metal alloy research was conducted in a large foundry prominent in this first decade beginning in 1917.



1927

NONSTRUCTURAL MATERIALS

This icon represents the introduction of textiles and fibers like nylon for use in parachutes, airplane fabric, balloons, glider tow rope, and tire cord materials beginning in the late 1920s. The Materials Section of McCook Field became a leader in materials and fatigue testing such as x-ray inspection and magnetic particle inspection for detecting structural flaws, cracks, and defects in steel tubing, gauges, steel propellers, and springs. A cold room was developed to test materials and clothing for high-altitude flying, testing hydraulic fluids and lubricants for control mechanisms at sub-zero temperatures, high altitudes, and impact on fatigue. Assessing the effects of bullet holes in metal propeller blades was also notable. Methacrylate plastic, a precursor to Plexiglas, was developed for stronger windows and turrets. In 1927, McCook Field operations were transferred to the much larger Wright Field, later to

become Wright-Patterson AFB. Laboratory equipment, chemical hoods, workbenches, and partitions were moved to the new Materials Branch.



1937

STRUCTURAL MATERIALS

Structural materials research took place as early as 1917, with materials specifications used in Systems Support. A shortage of airplane lumber drove research in laminated woods, glues, and kiln-drying techniques for laminated propeller blades represented by this icon. By 1933, aircraft were constructed primarily of metal. Aluminum spot welding replaced rivets. Anodic treatments for aluminum and alloys, zinc chromate primer, foundry techniques, and the first stainless steel wings were noteworthy. WWII shortages resulted in wood used to replace aluminum alloys in bomb bay flaps, wing flaps, trainers, and gliders. Research was done on effects of hot, humid, and cold temperatures on fuel and lubricant performance. Due to shortages of natural rubber, synthetic rubber was developed for tires. Assembly line production and quality control of aircraft and parts ramped up. The Materials Lab played a significant role in developing military design standards, handbooks, and databases for metals, non-metals, alloys, strength of materials, failure analysis, packaging materials, and rain erosion research. More than 2000 failure investigations were performed during WWII.



1947

OPTICS AND TRANSPARENT MATERIALS

Cold War challenges fueled research into optics in many applications, represented by this icon. Technological achievements were made in high-gain surveillance, transmission/reflective optics for tactical systems, laser mirrors and windows, filters for human eye protection and use in astronomy, forward-looking infrared windows for tactical armaments, solid state laser optics, and laser hardened space optics. Other research advancements during the 1940s and 1950s included

development of plastic windshields and canopies, glass fiber composites, and radomes for protecting radar equipment. Advancements were made in materials such as superalloys capable of withstanding high temperature/stress and more resistant to corrosion and oxidation; butyl rubbers; neoprene; and ceramic materials for use in high-temperature environments. All of these technologies aimed to make aircraft more durable and capable.



1957

INTERCONTINENTAL BALLISTIC MISSILES (ICBMS)

This icon of a nose cone cluster for reentry vehicles launched on an ICBM represents the growing emphasis on space during the Cold War. Advancements came in communications, navigation, strategic surveillance including infrared detectors, and lightweight spacecraft structures. Innovations included space-stable lubricants, elastomeric seals, space power materials, radiation-protected electronics, and spacecraft thermal control coatings. Experimentation of winged reentry vehicles evolved into applications for space vehicles including the Space Shuttle. Development of carbon-carbon composite heat shields for thermal protection of unmanned reentry vehicles, structural ceramics for high-temperature applications, and nuclear powered aircraft research evolved. Developments were made in semiconductor components, electronic circuits, erosion-resistant coatings, non-metallic materials and polymers.



(Continued on Page 11)

(Centennial Clock Brochure continued)



1967

MANUFACTURING TECHNOLOGY

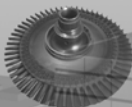
Starting with WWII aircraft assembly line production, this icon represents ManTech. Formalized in the 1960s, its function was to facilitate commercial production of advanced materials and manufacturing processes, the precursors to today's additive manufacturing. The 1970s brought integrated Computer-Aided Manufacturing and development of tools and processes to support manufacturing integration, influencing manufacturing at many companies. Notable advancements included rain/erosion-resistant coatings, fuel tank sealants, low observables for stealth materials, and laser-hardened materials for satellites. Rare Earth-Cobalt Magnets were developed for nuclear propulsion. The 1970s and 1980s brought refinements of non-destructive evaluation techniques such as ultrasonic equipment inspection to evaluate tiny, hidden flaws in critical structures, x-ray tomography for ICBM solid rocket motor inspection, composite airframe structures, and turbine engine components. The Materials Lab's west coast office was established, focusing on space and missile system developments, spacecraft contamination control, solar cells, and infrared detectors. As the Lab's mission grew, more research space was needed. A new facility was designed and constructed with upgrades to control temperature, humidity, vibration, and shielding from electromagnetic fields. New equipment was purchased, including a forging press, extrusion press, and a vibration-sensitive electron microscope.



1977

INNOVATIVE HIGH-PERFORMANCE TEAMS

The age of Total Quality Management brought a novel organizational structure to the Materials Lab. Emphasis was placed on effective partnering with industry and academia and creating high functioning teams, represented by this icon. Week-long intensive organizational development retreats focused on leadership, technical, strategic, and administrative topics and formed the Lab's foundational culture. Use of effective interpersonal relationship tools, roadmap reviews for industry, national expert-facilitated executive leadership team-building sessions, and international collaborations and partnerships all created the structure for how the Lab still operates today.



1987

TURBINE ENGINES

Reliable, cost-effective maintenance of aircraft has been an ongoing core mission of the Materials Lab since its beginnings.

Quick response and rapid solutions to field problems is critical to keeping Air Force assets operational. This icon represents enhancements in turbine engine inspections and high-temperature engine materials, thus, enabling improved durability and fuel efficiency, saving millions of dollars annually by keeping engine components in service longer. The Strategic Defense Initiative, also known as "Star Wars," introduced in 1983 by President Ronald Reagan, resulted in many important technical contributions by the Lab. Research evolved in directed energy weapons, surveillance, target acquisition and tracking, and survivability of spacecraft systems to (laser) weapons. Research in kinetic energy weapons, battle management, and development of countermeasures to protect aircraft from missiles that used infrared (heat-seeking) guidance evolved. The study of thermal effects of lasers on materials and structures, missile defense systems, and the Laser-Hardened Materials Evaluation Facility established in 1976 all played prominent roles in the 1980s.



1997

SPACE

The 1980s and 1990s were influential in research for space vehicles, represented by this icon of a satellite. Space surveillance, infrared detectors, thermal control coatings and nano technologies for traveling wave tubes used in satellite systems to amplify radio frequency signals, were key programs. Ceramic rocket nozzles used for propulsion, ICBM early warning and interceptor technologies, and spacecraft laser hardening to significantly increase spacecraft durability were also noteworthy advancements. Improvements in optics, high-temperature superconducting films, and space-stable lubricants all supported the Air Force's space mission. Many of these technologies originated from the Materials Lab and have been transitioned to the warfighter.



2007

ELECTRONICS

The unique nano-level understanding of space-based electronic devices developed in the Lab, represented by this icon, impacted not only the electronics technology community, but also the defense aerospace industry and the Air Force Space and Missile Systems Center. Space communications hardware was identified as the number one problem facing the Command. Challenges and innovations in the defense satellite communications systems and electronics led to sophisticated new laboratory electron spectroscopy capabilities to examine nano-level atomic features in infrared detectors and solve critical US military space communications and reconnaissance issues. Stretching back to the 1970s, electronic advancements in semiconductor crystals and thin films for electronic devices and radar applications continued to develop. Ultra-high purity silicon crystals, high-temp superconducting films, and crystals for improved semiconductor materials for high

power microwave and electronic devices were revolutionary technologies. Other notable technology advancements included molecular beam epitaxy film process control, high performance permanent magnets, printed wiring board passivation coatings, and high conductivity carbon-carbon heat sinks.



2017

NANOPARTICLES

Nanotechnology, represented by this icon, has taken a forefront in research and promises to revolutionize materials science. The ability to tailor materials on a nanometer scale has enabled development of never-before-seen properties and applications, forming the basis for revolutionary military capabilities such as biological- and chemical-sensing materials and ultra-lightweight armor. Advancements in the new super material graphene, the thinnest, strongest, and most conductive material known, has resulted in new methods for non-destructive and non-invasive materials evaluations. Integrated computational materials science and engineering has built a novel way to accelerate science by incorporating computational tools, high-throughput experiments, and a new ability to data mine large datasets being generated in worldwide research efforts.



FOR US TO DECIDE!

The twenty-first century presents many new challenges for the warfighter. The Materials and Manufacturing Directorate is dedicated to keeping the fight unfair against our adversaries and equipping the warfighter with advanced technologies and capabilities. What advancements does the future hold?

- Digital twin-digital thread: Computer modeling process that looks at the entire lifecycle of a system to optimize manufacturing, sustainability, and track performance; it will help optimize decision-making throughout a product's acquisition lifecycle.
- Flexible electronics for wearable devices, flexible sensors, and radar systems: It will continue to evolve, taking the technology from field testing to mature systems.
- Additive manufacturing: Using 3D printing capabilities to design and quickly "print" a myriad of affordable parts; it will continue to revolutionize manufacturing.
- Organic and ceramic matrix composites such as silicon-carbide composites for use in high-temperature turbine hot section components: It will push aircraft performance and efficiency.
- Autonomous research interfacing humans and robots: It will solve complex problems exponentially faster.
- Emerging concepts in physics such as quantum material research: It will continue to unfold, providing better understanding of molecular materials properties and applications.

What other novel research and capabilities will lead the way for The Materials and Manufacturing Directorate? Only the next 100 years will tell!

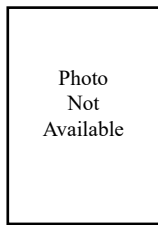
YOUR AFMMAA OFFICERS AND COMMITTEE CHAIRS



Matt Di Biase
President



Clay Harmsworth
Exec. Vice President



Roland Watts
Vice President,
Membership



Dennis Naughton
Treasurer



Don Shrader
Secretary



Dr. Hal Gegel
Scholarship



Terry Ronald
Web
Administrator



SEMIANNUAL JUNE BUSINESS AND MEMBER MEETING

This past June, the Semiannual AFMMAA member meeting was held at the Engineers Club of Dayton, with 34 friends in attendance. Colonel Chuck Ormsby, Materials and Manufacturing Acting Director, provided an update on AFRL/RX. That was followed by a short business meeting and our traditional fun around-the-room personal updates by all the attendees.



Attendees were: First Row: Dr. Vince Russo, Dr. Charlie Browning, Col. Chuck Ormsby, Matt Di Biase, Jim Mattice, George Schmitt, Tobey Cordell; Second Row: Bill Woody, Jerry Petrak, Dr. Walt Griffith, Dr. John Maguire, Kay March, Lois Gschwender, Dr. Wayne Ward, Dennis Naughton; Third Row: Dr. Larry Butkus, John Williamson, Warren Johnson, Dr. Merrill Minges, George Slenski; Fourth Row: Bob Albrecht, Dick Engman, Don Shrader, Dr. Terry Ronald, Tom Cooper; Fifth Row: Dr Bill Lampert, Dr. Jack Henderson, Dr. Sonny Pierce, Clay Harmsworth; and Sixth Row: Ken Elbaum, Dr. Bob Crane, Bob Drerup, John Speers, Ed Snyder

FALLEN COMRADES

Dr. Alan Lovelace passed away on 18 April. He received his Ph.D. from the University of Florida in Organic Chemistry. He was called for service in the Air Force in 1954 as a Second Lieutenant. His first assignment was to the Polymer Branch of the Air Force Materials Laboratory. In his subsequent civilian career he was the Chief Scientist and the Director of the Laboratory. He became the Deputy Assistant Secretary for the Air Force Office of Research and Development. In 1974 he transferred to NASA as the Technology Associate Administrator for the Office of Aeronautics and Space Technology, and this led to a role as Deputy Administrator of NASA from 1976 to 1981. For a critical period between U.S. Presidential administrations, he was the Acting Administrator for NASA during the first Shuttle launch STS1. For his guidance during this period, he received the Presidential Citizens Medal in June of 1981 from Ronald Reagan.

George P. Peterson passed away on May 7, 2018. He graduated from Columbia University with a degree in Mechanical Engineering. After graduation, he served on active duty as a 2nd Lieutenant in the Air Force at the Air Force Materials Laboratory. He went on to hold numerous leadership positions as a civilian, including twice being the Director of the Materials Lab. In 1974, he was cited as one of the top twenty U.S. contributors toward advancement in aerospace materials technology by Aviation Week magazine and was elected to the National Academy of Engineering. In 1983, he became the third person to ever be awarded a Lifetime Honorary Membership in the Society for the Advancement of Materials and Process Engineering (SAMPE). George retired in 1985.

Don Tarazano passed away on 27 April – Lifetime Member of AFMMAA and participated in many of the AFMMAA luncheons and meetings.

Ken Kojola passed away on 29 May – AFMMAA member and actively participated in the AFMMAA luncheons.

Dr. Katie Thorp passed away on 7 July.

Ronald Charles Decker, Lt. Col. (USAF Ret.) passed away on 28 December.

May they all rest in peace.

AFMMAA SCHOLARSHIP DONORS AS OF DECEMBER 2018

Since 2001, members of the Air Force Research Laboratory Materials and Manufacturing Directorate, AFRL/RX alumni, and friends of the Air Force Materials and Manufacturing Alumni Association for scholarship funding of \$56,500. RX members have donated over **\$50,000** to support our program funding by their CFC and United Way Programs to support this funding. We thank all for their generous giving. It is very essential to make our scholarship program so successful. The current 2018 donor amount changes/increases are shown in **bold**.

Platinum Donors (\$1000 and over)

Dr. Wade Adams
Tobey Cordell
Robert Denison
Dr. Thomas D. Fiorino
Dr. Ed Kuhl
Dr. Alan Lovelace

Ms. Kay March
Mrs. Julia Millham
Paul Propp
Dilip Punatar
John Williamson

Gold Donors (\$500 to \$999)

Lyn Brown
Dr. Harold Gegel
Tom Cooper
Gordon H. Griffith

Dr. Jack Henderson
Dr. Douglas Hutchens
Kenneth Kojola
Gary Waggoner

Silver Donors (\$200 to \$499)

AFRL/MLO
AFRL/ML Exec. Group
Dr. Larry Butkus
Jonathan & Janice Chasman
Dr. and Mrs. Ronald Eby
Ken Elbaum
Dick Engman

ML Executive Group
Meir & Ruth Pachter
Dr. George St. Pierre
John M. Speers
John Rohdehamel
Don Tarazano
Warren Johnson

Bronze Donors (\$100 to \$199)

AFRL/MLB
AFRL/MLLMN
Dr. Larry Bidwell
Maj. Gen. (Ret.) Terry L. Drake
Robert Drerup, Jr.
Dr. Barry & Sharon Farmer
Robert J. Gran
Ron Grogan
Jacques Hemes
Jim Huffman
Dr. Frank Kelley
Ronald Kerans
Lou Luedtke
Rich Lusignea
Bobby McConnell
Charlotte McConnell

Merrill Minges
Zoe Dell Nutter
Jerry Petrak
Paul Sampson
Robert T. Schwartz
Joe Sciabica
Don Shrader
Dr. Kathy Stevens
Dr. Edwin L. Thomas
Hardy Trolander
Andrey A. Voevodin
Roland Watts
Dr. Benjamin A. Wilcox
Dennis E. Wisnosky
Bill Woody

AFMMAA SCHOLARSHIP PROGRAM

The AFMMAA Merit Scholarship Program assists the college studies of high achievement, educationally oriented children and grandchildren of the current AFRL/RX civilian and military workforce. The funding of these scholarships currently comes from the dues paid by AFMMAA members, member donations to the scholarship fund and AFRL/RX employee contributions to the Combined Federal Campaign (CFC No. 85464). As of August 2018, Fifty-Five scholarship totaling \$56,500 have been awarded. The winners for 2018 for Chief Scientist are: Elizabeth Baur, Nicholas Durstock, Camille Butkus, Sam Boden, and Sarah John. Winners and families will be recognized at **Wednesday 16 January 2019** AFRL/RX Awards Recognition Ceremony at RX Bldg 653 Cafetorium at 0930. AFMMAA members are invited to attend.

AFMMAA SCHOLARSHIP DONOR INFORMATION

The Air Force Material and Manufactory Alumni Association (AFMMAA) was formed in 2002. Its primary purpose is to provide Merit Scholarships to the children of current members of AFRL/RX civilian and military employees. Since 2002 the AFMMAA was established to provide a charitable purpose to provided tax free scholarships within the meaning of Section 501(c)(3) of the Internal Revenue Code of Code 1986. It members ship included current AFMMAA employees, retired members and friends of the origination. To date (2002-2018) the AFMMAA has donated \$56,500 for 51 scholarships. All contributions are used for Merit Scholarships and operating cost. Our officers and support personnel are volunteers so our operating cost have be historical low 5% which is for PO Box, postage, office supplies, and printing of two annual member Newsletters. Members and friends may make donate. Recent pledges in memory of Don Tarazano by his family of \$10,000 have been received. Please contribute to our scholarship fund. Make a donation, special donations to recognize family, make or a living will or trust to the AFMMAA Scholarship Foundation.

RX MANAGEMENT UPDATE

RX management changes I'm aware of: Tim Sakulich is the new RX Director – from being the 711th Deputy Director; Rob Marshall who had been acting Deputy Director the past 14 months moved to RQW division chief; Scott Pearl (RXM Deputy Div. Chief) will be acting Deputy Director until a new 06 Deputy Director is appointed next summer; Dr. Larry Butkus, RX chief engineer will move to AFLCLC/EN - a new RX chief engineer to be appointed in a month or two. (from Dr. Merrill Minges)

DONALD O. TARAZANO

Don Tarazano died earlier this year. He was a Lifetime Member since 2009. He actively participated in the AFMMAA luncheons and served as a volunteer for the AFMMAA Scholarship evaluations and selections. He worked in the Pollution Prevention area, after a stint at AFSC Headquarters and in optics and laser research at Rome Air Development Center. The AFFMMAA accepted contributions to the AFMMAA scholarship fund in memory of Don and his contributions to the AFMMAA and the Air Force. His family, close friends and AFMMAA friends donated over \$11,551. Don's son and daughter contributed \$5,000 each, and they and his friends and AFMMAA members who contributed are:

Dr. D. Lawrence Tarazano (Fairfax, VA), Dr. Leslie Over (Dalton, PA), Sanjiva Pandey (Potomac Falls, VA), Mr. and Mrs. Donald Hanson, Rome, NY), M. Carol A. Hyland (Fredericksburg, VA), Mr. and Mrs. Charles and Jeraldine Grant (Midland, PA), Ms. Mary T. Wyderski (Bellbrook, OH), Mr. and Mrs. Lee and Karen Young (Alexandria, VA), Mr. and Mrs. Edward and Nancy Kress (Oriental, NC), Mr. and Mrs. Bucky and Elizabeth Gwartney (Alexandria, VA), Ms. Jessica Tekits Khouri, (Alexandria, VA), Mr. and Mrs. Ellis Barker (Summerville, SC), Mr. and Mrs. Frank R. Padula (Dunsmore, PA), Mr. and Mrs. Jose A. De Los Rios, Mr. John Williamson (Beavercreek, OH), Major John Speers (Kettering, OH), Col. Gene B. Welch (Beavercreek, OH) and Lt. Col. Dick Engman (Beavercreek, OH).

If you would like to contribute for our scholarship fund, you may make a donation, special donations to recognize family, or establish a living will or trust to the AFMMAA Scholarship Fund.

AFMMAA CHARTER AND LIFE MEMBERS AS OF 30 NOVEMBER 2018

We currently have 107 Life Members. Eight new “Lifers” (shown below in **Bold**) recently became Life Members – **Bob Denison, David Dickson, John R. Fenter, Dr. Claudia V. Kropas-Hughes, Dr. John Maguire, Charles D. Ormsby, Carl E. Snyder, and Dr. Som Soni.** If you are not a “Lifer” we encourage you to sign up now. If you wish to become a Life Member, pay yearly dues or contribute to the scholarship fund, please use the membership and scholarship donors form in the Newsletter or on the www.afmmaa.org website. Your memberships and scholarship contributions are very necessary for our mission and to grow our annual scholarships. A list of the Charter and Life Members is shown to the right. ➡

WE WANT TO BE INFORMED

Are you receiving email from the AFMMAA? We try our best to keep everyone informed of the monthly luncheons, annual meetings, other current events and your personal replies using “Recent Membership Information” to our Newsletters. We want you to be informed of all these special RX events.

However, we have a problem. Some members have moved or changed their email address to a new provider. If you are not receiving our emails and want to be informed of AFMMAA and RX events, please send your new email address to Neal Ontko, Membership Chairman (nontko@utcd Dayton.com).

AFMMAA Charter and Lifetime Members

Charter Members

Dr. Wade Adams	Dr. Craig Hartley	Bob Rice*
Bernard Chasman*	Dr. Bill Kessler	Lynn Trainor
Tom Cooper	Jim Mattice (SES Ret)	Dr. Ben Wilcox*
Dr. Gary Denman	Dr. James Myers	John Williamson

Lifetime Members

Robert Albrecht	Dr. John Henderson	John Rhodehamel
Mark Anderson	Ed Hermes	Dr. Terry Ronald
Dr. Tia Benson-Tolle	Dr. Claudia Hughes-Kropas	Dr. Vince Russo
Dr. Larry Bidwell*	Rob Hull	Col (Ret) Tim Sakulich
B/Gen (Ret) Phil Bouchard*	Dr. Kumar Jata	Paul Sampson
Lyn Brown	Anthony “Tony” Jensen	Dr. Bob Schafrik
Dr. Charles E. Browning	Henry Johnson	George Schmitt
Dr. Tim Bunning	Warren Johnson	Stan Schulman
Dr. Larry Butkus	David Judson	Joe Sciabica
Dr. Dale Chimenti	Dr. Frank Kelley (Hon.)	Dr. Shashi Sharma
Dr. John Christian	Bob Kineses	Don Shrader
Dr. Bob Cochoy	John Koenig	Jerry Sieron*
Dr. Dennis Corbly	Dr. Ed Kuhl	George Slenski
Tobey Cordell	Dr. Bill Lampert	Dr. Jim Snide
Lt Col (Ret) Ron Decker	Cole Litton*	Carl E. Snyder, Jr.
Bob Denison	Tom Lockhart (SES)	Dr. Som Soni
Matthew DiBiase	Dr. John Maguire	John Speers
David Dickson	Dr. James Malas	Dr. George St. Pierre
Robert Drerup, Jr.	Kay March	Kermit Stearns
Ken Elbaum	Dr. Michael McCabe	Dr. Katherine Stevens
Lt Col (Ret) Dick Engman	Bobby McConnell	Donald Tarazano*
Kathleen Falensky	Charlotte McConnell	Scott Theibert
Frank Fecek	Dr. Enrique Medina	Jon Tirpak
Dr. Larry Fehrenbacher	Dr. Dan Miracle	Angie Tymofichuk (SES Ret)
Dr. John R. Fenter	Dr. Tom Moran	Dr. Andrey Voevodin
David W. Fischer	Jim Mullineaux	Gary Waggoner
Don Forney*	Dennis Naughton	Dr. Dave Walker
Dr. Hal Gegel	Dr. Melvin Ohmer	Dr. Chuck Ward
Col John W. Gloystein	Neal R. Ontko	Dr. Wayne E. Ward
Henry C. Graham	Col Charles Ormsby	Roland Watts
Dr. Alten (Skip) Grandt	Dr. Nick Pagano	Dennis Wisnosky
Gordon Griffith	Larry Parsons	Bill Woody
Dr. Walt Griffith	Jerry Petrak	Col (Ret) Carol Yarnall
Lois Gschwender	Dr. Cyril (Sonny) Pierce	
Jeff Guthrie	Dilip Punatar	
Dr. Jim Hall	Bob Rapson	*Deceased



COLD WEATHER TIPS

CHECK TIRES

When temperatures fall, air inside tires contracts and causes the pressure inside to drop, which can make tires susceptible to damage.

CHANGE OIL

Colder temperatures can cause motor oil to thicken, which can cause starting problems. Change your oil just before winter to help keep oil flowing easily through your engine to help your car start easier.

AFMMAA
P.O. Box 341413
Bevercreek, OH 45434-1413

PROPOSED MEMBERSHIP DUES

The Executive Board has proposed changes to the Membership dues structure. Membership dues have held steady for a very long time and an increase is needed to keep up with costs for postage and administrative supplies. The changes proposed will increase annual membership dues to \$20 per year and lifetime memberships to \$200. Also proposed is a one-time offer for existing annual members to convert to lifetime membership at the current rate of \$150. The proposed changes will be presented and voted on by the Executive Board at one of the 2019 semiannual meetings but will not affect membership dues until approved.

AFMMAA ALUMNI CORNER

Reserved for you!! We are looking for short articles about your experience(s) in the Laboratory or current anecdotal experiences that would be of interest to the AFMMAA members. Depending upon the response, we hope to begin including your articles in the 2019 Spring edition of the AFMMAA Newsletter.

NOTICE

In order to control our costs and optimize our service to RX and our members, we are considering only mailing Newsletters in the future to AFMMAA Members (Charter, Life and Annual). If you have not already done so, please take advantage of this opportunity to fill out the membership form (Page 9) and continue to enjoy our Spring and Fall Newsletters.