Fort Wayne Engineers' Club

Engineers' News December 2018 Vol. 81 No. 4

www.FortWayneEngineersClub.org

Find us on

December Social

Rod Vargo and Joan Woerner Home
1123 Ludwig Park Drive, Fort Wayne, IN 46825
Saturday, December 8th at 4:00-8:00 PM (Come and Go as you please)

An Open House (come and go as you please) informal social for members and nonmembers is Saturday, December 8, from 4:00-8:00 pm (come and go as you

please) at the home of Rod Vargo and Joan Woerner, 1123 Ludwig Park Drive, just south of Smith Field's newer terminal:

PLEASE BRING YOUR OWN DRINKS EXCEPT for bottled water (tap water also "award-winning"). Folks have too many drink preferences to anticipate needs. Two dedicated refrigerators will be available, and multiple microwaves.

The house has a lifetime of curiosities and more, including for kids (but not child-proofed). Three of Joan's & Rod's young adult sons will be here, likely full of good chat including paths to being self-sufficient. One son has a decade of experience importing honey and other items from around the world, particularly parts of Africa "where no one has seen a white person before." He grew up in California and is based in downtown Boston. Another son, visiting from Minneapolis, has focused for a decade on management of urban environments, and makes his own medieval armor for melees. A third is a 2017 EE Rose-Hulman graduate who is becoming responsible for electrical aspects of a steel mill near Lake Michigan, and has intermittently worked drones. A young friend may attend who trained at FWCS-Anthis and Ivy Tech in airline engines and maintenance. A popular woodstove in an enclosed back porch will be available. A modern virtual reality game system may be set up, poised to participate in Microsoft's developing embedded reality concepts.

We will provide pizza and a variety of food. Requests and suggestions prior to the gathering are very welcome (416-0986).

Some parking will be on grass. Look for blue lines. Do NOT park on the asphalt part of the driveway because that blocks parking spaces. Parking on the street is okay.

Please Give Feedback

What is the best time on a Thursday for participation in tours?

Please direct this and any other feedback to Rod Vargo at rodvargo@comcast.net or leave a voice message at (260) 416-0986

FWEC Membership

The FWEC exists through funding of its membership. Please forward your copy of the Engineers' News to prospective members and encourage their attendance at tours. Remember, the FWEC is the best deal in town, annual membership is $10. We offer free monthly tours September through May. Please be sure to recommend FWEC membership to your colleagues and friends.

TekVenture News

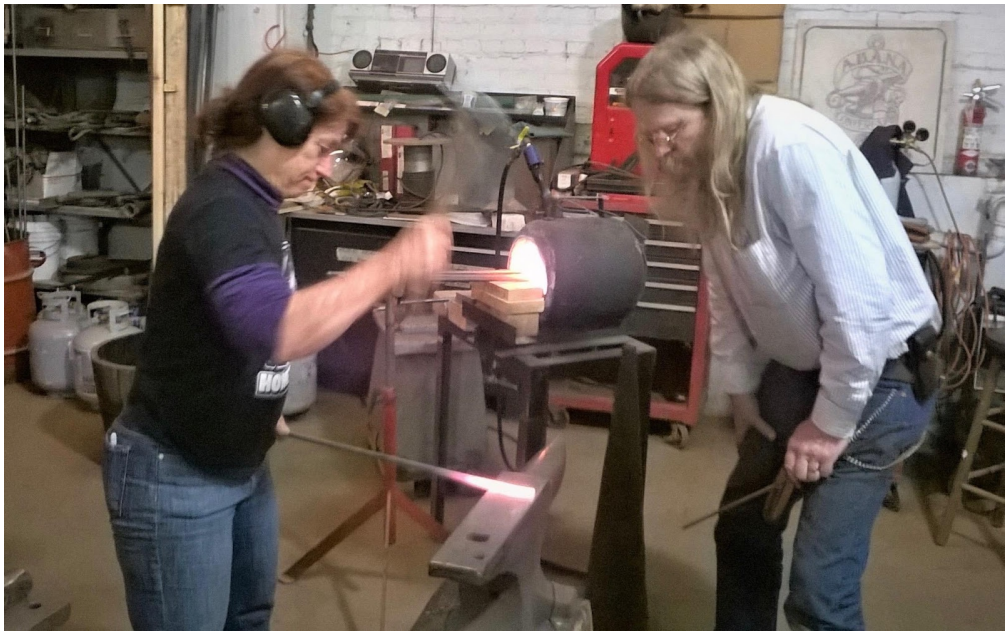
Some Holiday Events for individuals and families at TekVenture:

ElectroWorx, Basic Electronics User Group meets Dec. 5 and Dec. 19, 5 PM - 8 PM, Free to TEK members; info call Mick at 260.672.2706.

Fort Wayne Inventors Club meets December 8 (Saturday morning) this month. Info: gaskew@askewipllc.com (patent attorney; TekVenture member; and Fort Wayne Engineers Club member).

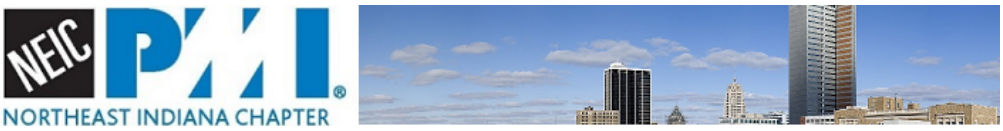
Make-A-Gift Workshop plus 'Snafu In Santa's Workshop' play performance mid-December; info call Jeannette 260.750.9013.

For additional events, workshops and membership info: www.tekventure.org or facebook.



Blacksmithing at TekVenture. This and other facilities are located at 1550 Griffin Street, Fort Wayne, near the Hosey Dam.

Northeast Indiana Chapter Project Management Institute



Dec 4th Dinner Meeting - Managing a Project Team of Highly Skilled Professionals - by David Maynard

Topic: Managing a Project Team of Highly Skilled Professionals by David Maynard

Abstract:

Dave will discuss "Managing a Project Team of Highly Skilled Professionals" at length encompassing informational diversity, cross-functional teams, Innovation, Inevitable conflict, War rooms and much more.

BIO:

Dave is a native New Yorker who after graduation from college, traveled to Houston to work for NASA at the Johnson Spacecraft Center, where he worked for many years in varied roles.

After leaving NASA, Mr. Maynard was asked to become the General Manager of Systems Management Inc. (SMI) in Orlando, Fl. whose mission was to turn-around troubled projects, programs or operations.

Dave teaches Project Management at Purdue University, Fort Wayne (PFW) and Indiana University, Indianapolis (IUPUI). He is active the PMI-Northeast Indiana Chapter of which he was a founding member. He volunteers for PMI global in various capacities.

Date: Tuesday, December 4th, 2018

RSVP Deadline: Sunday, December 2nd, 2018

Location: Don Hall's GuestHouse**, 1313 W Washington Center Rd, Fort Wayne, IN 46825**

5:30 PM – Networking/Social

6:00 PM – Dinner

6:45 PM – Announcements

7:00 PM – Presentation

8:00 PM - Adjourn

- NEIC chapter members: dinner and speaker - $20
- In Jobs-Transition or Student Membership - $10
- Non-members: Dinner and speaker - $30
- Speaker Only: $0 (Members), $10 (Non-Members)
- Pay now with credit card only; pay at door option is no longer available

Register Now

Northeast Indiana DiscoverE

This chapter of DiscoverE is a subcommittee of Fort Wayne Engineers Club and its annual cycle revolves around national "Engineer's Week" each February (officially the 17th-23rd this season). Pertinent dates for 2019 (see www.DiscoverE.in if needed):

- December 31, 2018: Requested deadline for committing to a college scholarship donation this year. Are tax-deductable and/or suitable as advertising expenses.
- January 11 (Friday): DEADLINE FOR COLLEGE STUDENT SCHOLARSHIP APPLICATIONS (each $1,000, plus Banquet expenses).
- January 26 (Saturday): Future Cities competition (physical models) at Purdue University, Fort Wayne.
- February 8: deadline for reserving February 23rd Banquet tickets.
- February 16 (Saturday): Junior high school (i.e., middle school) Bridge Building competition (destructive testing) at Concordia Lutheran High School.
- February 23 (Saturday): High school level Bridge Building competition (destructive testing) at Purdue University, Fort Wayne.
- February 23 (Saturday) evening: DiscoverE Awards Banquet (awards, scholarships, and speaker) at Parkview Field.

November Tour Summary

Gordon Tool
1301 OH-49, Payne, OH 45880

Tour of Gordon Tool, Inc., and the Long Term Future of Machining.
November 15, 2018

This tour became a broad exploration of a nationwide industry with massive numbers of vacant employment opportunities at livable wages which have persisted for a decade across economic booms and busts, and which are available to the spectrum of individuals in this fine nation.

Machining (or "subtractive manufacturing") mixes traditional tooling and most forms of advanced technologies to produce works of art literally essential to every aspect of reality as we know it. Rumors that 3-D printing (or "additive manufacturing") would have already replaced machining have proven seriously incorrect. Rumors also ignore that 3-D output typically requires subsequent finishing. Subtractive manufacturing refers to removing material from starting pieces of material (not necessarily a solid block in shape). Additive manufacturing refers to building up material in tiny increments of material, such as melted plastic or sintered metal. Both technologies will be essential long-term.

Reprinted by permission from The Wall Street Journal (WSJ) of November 3-4, 2018, and author Larry Kaufmann, RepExact LLC, Annapolis, MD:

"As a manufacturer's representative with both traditional and advanced manufacturing technologies, I agree with … skepticism … of imminent, fully autonomous, global 3-D manufacturing. Certainly, additive manufacturing continues to develop and can be a good choice in some situations, especially for prototyping, low volume manufacturing, recreating obsolete parts, for making objects that cannot be machined (such as those containing internal voids) and for highly specialized work.

Two of several drawbacks are worth mentioning. First, components are designed in thousands of different materials and alloys for reasons of performance (hardness, resistance to corrosion, etc.). Some plastics cannot be made in a form suitable for 3-D printing or require specialized equipment. Metals are most commonly printed using metal powder. Since cross-contamination must be avoided, cleaning the equipment between runs of different materials is very time-consuming, so that most metal 3-D printers run only one type of material. Second, the surface finish and dimensions of the object are generally not comparable to what precision machining can achieve, requiring secondary operations that make the printed part more expensive than machining.

Subtractive manufacturing is also not standing still. Machine-tool manufacturers are

introducing computer numerical control machining centers with ever-increasing additional functions, such as laser, electrical discharge or water-jet cutting, that expand equipment capabilities while reducing overall cycle times, the ultimate determining factor in cost. My customers and I always evaluate all manufacturing options but usually end up selecting a conventional process."

Gordon Tool is equipped to use electrical discharge, water-jet, or conventional carbide bits to work wood, plastic, stone, ceramics, and metal into mechanical parts, hand tools, decorations, and much more. The projects range from handwork to various forms of programmed computer-controlled automation.

Their water-jet, for instance, uses 50,000-60,000 psi water with garnet grit through a "disposable" $150 nozzle to work raw material, typically steel or aluminum, up to 6 inches thick, over 6 feet wide, and over 12 feet long. In the picture above, the nozzle is inside the yellow cup at water level, and its left-right movement determined by the large black drum. The process usually occurs in a water bath and was pleasant to watch. Even the sound did not compete with our conversations. Gordon Tool does not use laser-cutting for a number of reasons including heat from a laser can modify the metal (or whatever other material is being used), availability of workers limits utilization of expensive equipment throughout the machining industry, and it is more cost effective to focus on one or the other technologies (especially since workers are scarce).

Their wire EDM (Electrical Discharge Machining) is inside the orange and white cabinet (see picture above). It uses an electrically charged wire to discharge into the material being cut or shaped, which must be conductive (such as metal). The discharge reaches 14,000-22,000 degrees F multiple times a second at a minute point and removes (cuts and/or shapes) a piece the size of soot, providing spectacular precision and finish. The wire is "disposable" at $400 per reel. The system is flushed, cleaned and cooled by a constant flow of de-ionized water. Intensely tight tolerances are readily achievable. If desired, these light tolerance can produce nested shapes such as corporate logos which slide out of a larger mass, and spiral shapes which resemble nested coil springs. Increasingly, EDM can compete with 3-D printing in terms of producing internal cavities. To shorten this report, detail may be seen at www.youtube.com/watch?v=pBueWfzb7P0.

Conventional tooling is also widely utilized at Gordon Tool but typically automated and contained within cabinets, which control odors, debris, and noise. Worker tasks are variable and flexible, based on skills, but can include initial CAD design, initial mechanical setup, machine computer settings, a limited amount of oversight, and any number of subsequent finishing steps. The inventory and location of hundreds of specific cutting tools, such as drills, are largely monitored by computer. The picture depicts an open cabinet with a working platform, which automatically moves, and an overhead computer-controlled drum, which holds an array of carbide bits.

Machining skills allow a worker to often make their own personal items, from hard-to-find repair parts to fantasy projects. The range of materials is almost unlimited.

In a personal e-mail from Larry Kaufmann, he wrote an appropriate conclusion:

"My manufacturing partners are finding their expansion limited not by a lack of degreed engineers, but by not being able to find qualified workers to set up, run, and service the complex equipment on the shop floor. There are many hands-on youths that are being pushed by parents and high school counselors to attend a four-year college for a piece of paper and uncertain job prospects, while they would be happier (and quite well paid) actually making things. We desperately need to bring back apprenticeships, and give them the respect they deserve."

An Editor of the WSJ expressed similar views in an e-mail. A recent WSJ article reported that roughly 30%-70%, of college graduates, depending on major, take jobs which did not require a degree. The figure for engineering majors was 29%. Our October tour, of Bolt Sleepers, revealed that six of their engineers had degrees and

six were self-taught, largely from machining or welding backgrounds. In business for thirty years, Gordon Tool used and uses a mixture of skill sets arising from both paths. Machinists can progress to degreed engineer, and vice-versa, often despite various "disabilities". Fact is, machining is enduring as a flexible, well-paid, and healthy long-term opportunity almost regardless of the individual involved.

Our sincere thanks to Bill and Lori Gordon, and others who turned out to support machining as a profession.

Future Tours

January tour: Northeast Indiana Regional Coordinating Council (NIRCC)
Thursday, January 24, 7:00 pm, Citizens Square, Room 030 (the nice "Courtroom", NOT the Omniroom, in the basement)

The Director of NIRCC will provide an overview and then be open for serious give and take regarding virtually all transportation planning and priorities from now through 30 years into the future. NIRCC has a history of following through on properly researched suggestions. They tend to effectively navigate political factors, various trends and fads, and funding sources.
Contact Rod Vargo (416-0986) if needed.

February tour: Franke Plating Works, Inc. Thursday, February 21, time to be determined. 2109 E Washington Blvd, Fort Wayne, IN 46803 (2 blocks east of Anthony Blvd.)

Visit a family business in operation continuously since 1930, progressively expanding and updating an array of options for anticorrosion, appearance, and other features of iron, steel, copper, aluminum, and more. This should help our understanding of the metal product or part durability in daily life.

March tour: TekVenture's new location and expanded areas of interest. March 21, 2019, at 1550 Griffin Street, near the Hosey Dam. Starting time will probably be 6:30 or 7:00 pm.

TekVenture has steadily upsized and updated since its start in a trailer downtown. Current plans for March 21 call for TekVenture's specialists to demonstrate the work areas and guidance which are available to young people and adults. A few simple projects may be available to make during our tour.

Most of TekVenture is intended for all ages. Expansions include theater,

woodworking, and an active Fort Wayne Inventors Club. The FW Inventors Club is also potentially helpful if interested in patent law.

PLEASE MONITOR FUTURE NEWSLETTERS FOR REQUIRED CLOTHING AND OTHER DETAILS.

FY19 FWEC Board Opening

The FWEC is looking for a Vice-President for the FY19 (2018-2019). Board positions are crucial to the planning of tours and events for the FWEC. Please consult the FWEC constitution or contact us at info@fortwayneengineersclub.org for information on specific duties on board positions.

FWEC roster for FY2018-2019

Proposed FWEC roster for FY 2018-2019:
President: John Magsam
Vice President: Open and under discussion; comments and suggestions welcome.
Treasurer: Ryan Stark.
Treasurer Trainee: Volunteer needed.
Secretary: Marna Renteria.
First-year Board Members: Morgan Miller. Another volunteer needed.
Second-year Board Member: Dave Gordon. Another volunteer needed.
Third-year Board Member: Rod Vargo. Craig Welch.
Editor of Engineer News: Maruf Ahmad.
Membership and Contact Chair: Dave Schaller.
Northeast Indiana DiscoverE Chair: Rob Cisz.

Sincere thanks to outgoing Officers and Board Members: Bharat Rajghatta, Elizabeth Garr, Ellsworth Smith, and Jon Cook.

PLEASE CONSIDER STEPPING UP INTO ONE OF THE OPEN POSITIONS. Most require
very little time. The economy is booming, so tasks are being distributed across more people. The outgoing individuals are experiencing increased demands outside FWEC. Historically, Board Member ages range from high school through retirement. Participation tends to return more than it takes.

FWEC Board Meetings

Fort Wayne Engineers' Club board meetings are open to all FWEC members. The next FWEC board meeting will be on Tuesday, December 4th at 7:00 PM. Board meetings are held on the Indiana Tech campus in the Academic Center in room ACC-201.

Advertise in the Engineers' News

The FWEC provides advertising space within the Engineers' News. Advertisements are $10 per issue and limited to ½ page of content. For submissions please contact info@fortwayneengineersclub.org.
