



**THE AMERICAN SOCIETY  
OF**

**Central Oklahoma Section Newsletter**  
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The Section is located at: Oklahoma Engineering Center, 220 Northeast 28<sup>th</sup> Street, Oklahoma City, OK 73105

The Central Oklahoma Section Newsletter is nominally published nine times per year to convey monthly meeting dates, meeting topics, section activities, and/or other ASME information to its membership.

\*\*\*\*\* **JOINT ENGINEERING SOCIETIES BANQUET** \*\*\*\*\*

**PROGRAM: "Science and Engineering Opportunities at Tinker Air Force Base"**

**SPEAKERS: Colonel Charles M. Gaona, U.S. Air Force Deputy Director of Engineering and Technical Management at Tinker Air Force Base (TAFB).**

**DATE: Thursday, Feb. 25, 2016      LOCATION: Oklahoma Christian University, Gaylord Student Center, 2501E. Memorial Road, Edmond, OK**

**Tinker Air Force Base**



The Air Force Sustainment Center (AFSC) provides sustainment and logistics readiness to deliver combat power for America. The center provides war-winning expeditionary capabilities to the warfighter through world-class depot maintenance, supply chain operations and management and installation support. The AFSC provides critical sustainment for the Air Force's most sophisticated weapons systems, including: A-10 Thunderbolt II, AC-130, B-1 Lancer, B-52 Stratofortress, C-5 Galaxy, C-17 Globemaster III, C-130 Hercules, E-3 Sentry, E-6 Mercury, E-8 Joint STARS, EC-130, F-15 Eagle, F-16 Falcon, F-22 Raptor, F-35 Lightning II, HC-130, HH-60 Pave Hawk, ICBM, KC-135 Stratotanker, MC-130, RQ-4 Global Hawk, U-2 Dragon Lady, and UH-1 Iroquois aircraft as well as a wide range of aircraft engines and component parts.

Col. Gaona will highlight these efforts along with other technical opportunities that are available at TAFB. **Please join us on February 25 for this banquet and program!** Attendees will receive 1-PDH Continuing Education credit!

**Time:** 5:30-6:15PM: Meet & Register at the OC Gaylord Center      6:15 – 7:30PM: Opening and Catered Meal  
7:30PM: Proceedings & Program by Colonel Gaona

**Cost:** Tickets are \$17 per person and available via [www.OSPE.org](http://www.OSPE.org). Ticketing deadline is Monday, February 22.  
For help with tickets call or contact Ms. Kris Sanders, OSPE Director, at (ph) **405-872-6773** / (e) **kris@ospe.org**

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## ADDITIONAL FEBRUARY MEETING INFORMATION



The Banquet speaker features **Col. Charles M. Gaona**, the Deputy Director of Engineering and Technical Management for the Air Force Sustainment Center (AFSC) at Tinker Air Force Base (TAFB). Col. Gaona's AFSC team is responsible for the development, implementation, and oversight of the Center's technical goals, policies, processes, and technology transition. Included is responsibility to lead the technical direction of a workforce exceeding 4,500 science and engineering professionals supporting the center's mission at three locations (Robins AFB, Georgia, Hill AFB, Utah, and Tinker AFB, Oklahoma) and encompassing depot maintenance, repair, and overhaul activities; supply chain management; and a world class software maintenance and development enterprise.

Col. Gaona was commissioned as a Distinguished Graduate of the Reserve Officer Training Corps in 1994. He earned a B.S. in Electrical Engineering with Distinction from the University of Colorado, a M.S. in Electrical Engineering as a distinguished graduate of the Air Force Institute of Technology, and Ph.D. in Biomedical Engineering from Washington University in St. Louis. During his career, he has held a variety of depot, research laboratory, and program office positions in Air Force Materiel Command. He has also served in leadership positions at Air Force Basic Military Training and on the faculty of the United States Air Force Academy (USAFA).

### MEMBERS NOTE: February Engineers Week Activities



**Engineering Fair:** See the banner below via [www.oef.org](http://www.oef.org) (Oklahoma Engineering Foundation). The fair will be Tuesday, February 23, 2016 at the Oklahoma Science Museum (Omniplex) on NE 52ns Street in Oklahoma City. Our Section will again host the Bruce Stout/Wendell Cavin Rubber Band Powered Vehicle Contest.

Volunteers are needed to help judge the competition and help register student participants. Volunteers are being asked to sign up via the OEF website at <http://www.oef.org/volunteers/engineering-fair-volunteers>. Use the "Rubber Band Powered Vehicle Contest Volunteers" link.

## Engineering Fair

**STEM EMPOWERS OK**

Engineering Fair Oklahoma!

The 2016 Engineering Fair sponsored by GE Foundation

February 23, 2016

Oklahoma Science Museum \* 2100 NE 52nd, OKC, OK

Registration begins at 8:30am

Opening Ceremonies begin at 9:00am

Contests begin at 9:30am

MATHCOUNTS

Engineering Fair

The Engineering Fair is an engineering competition having bridge building, eiffel tower, electric motor, essay, ping pong ball launcher, rubber band powered vehicle, and wacky wonder works contests.

Future City

continued next page

**MATHCOUNTS:** MATHCOUNTS information is also available through [www.oef.org](http://www.oef.org). The central Oklahoma regional competition will be held February 20, 2016 at Oklahoma City Community College. To volunteer to help, sign up via the OEF website at <http://www.mathcountsok.org/index.php/volunteers/central-region> and select Proctor or Grader link.

**For more information about these events** or other OEF functions please contact Ms. Adrienne Covington-Graham, OEF Executive Director/CEO, at (phone) 405-528-1435 or (e-mail) [info@oef.org](mailto:info@oef.org).

### ***NOTICE to All ASME Central Oklahoma Section Members***

**Sign up with ASME-GPS for continued access to ASME Membership & Benefits Information. Steps are:**

- Go to [www.asme.org](http://www.asme.org) ,
- Under Communities, Click on “GPS Tool”,
- Then, Click on “Online Tools & ASME.org”,
- Under ASME.org, click on “Join the ASME.org Community Help & Support Page”,
- Then, Click on “Tutorials”,
- Then, Click on “ASME Members-How to Access your Membership & Benefits”,
- Follow Directions & select/join Groups (including the Central Oklahoma Section Group),
- If experiencing problems, then contact: [CustomerCare@asme.org](mailto:CustomerCare@asme.org) or call ASME Customer Service at (800) 843-2763, per instructions!
- **If still having problems (or no response) then contact:** Kyle Leigh Avery at [leighaveryk@asme.org](mailto:leighaveryk@asme.org) or call at (212) 591-7561 **and/or Ty Booker** at [bookert@asme.org](mailto:bookert@asme.org) or call at (212) 591-7911.

### ***Nominations Sought for Central Oklahoma Section Awards***

The executive committee has established seven (7) awards to recognize the section and student members who are making outstanding contributions to their section or the profession of mechanical engineering. The recipients of these awards will be recognized at the April 23rd Central Oklahoma Section Meeting. Up to four ASME COS Engineering Scholarship Grants will be awarded at that time as well—[Application attached and linked to here](#).

**Outstanding Engineer Award** – To be presented for outstanding professional and technical organization activities and achievements. Also considered will be community and civic activities along with awards received. The nominee must be a member of ASME.

**Minority and Women Engineer-of-the-Year Award** – To be presented for outstanding professional and technical activities by a minority or woman engineer. In addition, community and civic activities will be considered as well as awards received. The nominee must be a member of ASME.

**Outstanding Engineer-in-Management Award** – To be presented to the engineering manager deemed by the nominator to have done an outstanding job in furthering the goals of ASME and the engineering profession. The ability to select and develop engineers as well as to communicate with and motivate engineers will enter into the selection of awardee. The nominee must be a member of ASME.

**Outstanding ASME Student Member Awards** – Four awards will be made in recognition of academic achievement and outstanding service to an ASME student section. The Jerald D. Parker Award will be awarded at Oklahoma Christian University; The James H. Boggs Award will be awarded at Oklahoma State University/MAE; the Tom J. Love Award will be awarded at the University of Oklahoma & an Outstanding Student Award will be awarded at Oklahoma State University/MET.

**For application and/or additional information contact Ed Reynolds**, 6507 N.W. 96<sup>th</sup> Street, Oklahoma City, Ok. 73162, Phone: (405) 721-6753, E-mail: [edwin\\_c\\_reynolds@yahoo.com](mailto:edwin_c_reynolds@yahoo.com). (Nomination deadline is March 24, 2016)

## **Oklahoma Society of Women Engineers (SWE) Events**

Below are two upcoming Society of Women Engineers (SWE) Events to which you are invited! Please pass this information to others who might be interested in attending.

**Tuesday, February 23 at 5:30pm – LEVEL Clubhouse:** **Dale Carnegie Presentation** from the popular book, How to Win Friends and Influence People, 123 NE 2nd Street Oklahoma City, OK 73104 (located at the SE corner of NE 2nd and Walnut in downtown OKC. Street parking is available and food is available for purchase from the local market, Native Roots. **Please RSVP to [swe.okc@gmail.com](mailto:swe.okc@gmail.com).**

### **Boeing: *Uplift* Competition - Enter before April 1, 2016**

The Boeing Company is looking for enthusiastic college students from across the country to compete in the *UpLift* Competition for the chance to win great prizes, including a job interview at Boeing and a trip to Seattle. *UpLift* competition registration is open and runs through April 1, 2016. Please share competition information with students and student groups, or faculty and staff who teach and mentor technology students. Competition details can be found on the website: <http://www.boeing.com/uplift>.

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## **NEWS ITEM OF INTEREST**

### ***NASA Rover Designed To Last 90 Days Celebrates 12 Year Anniversary***

Posted Jan 28, 2016 by Emily Calandrelli (@TheSpaceGal)

(courtesy <http://techcrunch.com/2016/01/28/nasa-rover-designed-to-last-90-days-celebrates-12-year-anniversary/>)

**This week NASA's Mars Opportunity rover celebrated its 12 year anniversary on the red planet.** What's truly remarkable about this is the fact that **the rover was only designed to operate for about 90 days.**

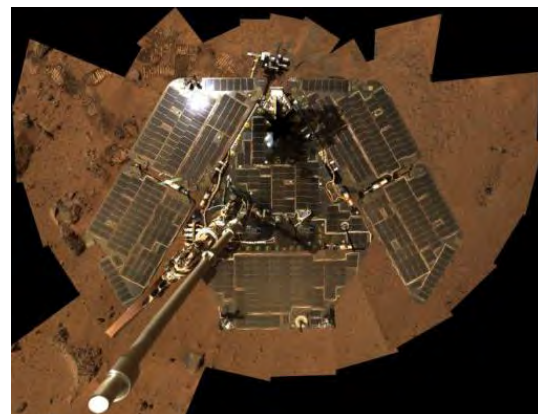
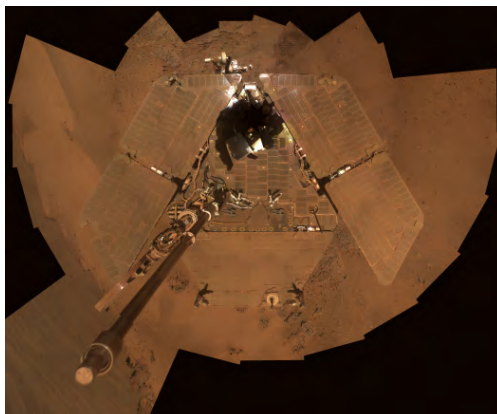


Due to helpful unforeseen surface conditions and few creative software changes, NASA has been able to keep Opportunity alive and operational to this day.

After a six-and-a-half month journey from Earth, Opportunity entered the Martian atmosphere and used a parachute, retrorockets, and a cocoon of airbags to land safely on the surface back in January of 2004.

One of the reasons NASA believed the rover would only function properly for 90 Martian days was because of the extreme level of dust on Mars. This dust was predicted to build up on Opportunity's solar panels and eventually, the rover would be unable to receive power.

Receiving solar power on Mars, which is 50 percent farther away from the Sun than Earth, was a known challenge even without the dust. NASA designed Opportunity's solar panels to be as wide as possible in order to collect as much sunlight as it could. Even so, the lifetime of Opportunity was measured in days, perhaps months, but certainly not years.



(left) Opportunity's solar panels covered in Martian dust / Image courtesy of NASA

(right) Opportunity rover after a dust devil cleaning / Image courtesy of NASA

Luckily, a surprising thing happened: every once in a while, whirling columns of air, or "dust devils," swept over the rover and cleaned off the coating of dust from the solar panels.

This was a godsend to Opportunity and the NASA team who operated it. Dust build up would continue to be a challenge, but Martian dust devils have helped keep the rover's lights on.

Collecting sufficient solar power wasn't the only problem Mars threw NASA's way. In its first year, Opportunity found itself slightly buried in a sand dune. Engineers and scientists at NASA's Jet Propulsion Laboratory recreated the scenario with an Opportunity mock-up and identified a sequence of wheel rotations that would ultimately set the rover free.

In addition to hardware issues, Opportunity's software has required a few upgrades over the years. NASA had to perform remote software updates to improve the rover's visual detection, photography, and hazard detection capabilities.

Sending a rover all the way to Mars is expensive. It's a fraction of the price of sending a human there, but it still cost NASA \$400 million to build Opportunity and get it on the surface. Squeezing more science out of that expensive rover helps enable NASA to justify the time and money it took to get it there.

The fact that NASA has kept the rover operational for 12 years is a feat of engineering and ingenuity, but not everyone agrees that NASA should keep it running. It costs about \$14 million per year to operate Opportunity and it's just not as capable as it once was.

Two of Opportunity's scientific instruments no longer work, its joints occasionally lock up, and it experiences periods of amnesia due to problems with its flash memory. Even so, the rover continues to accomplish useful scientific work. In recent years, researchers used Opportunity to examine a series of large craters in order to get a look at older layers of Mars' history.

The rover has also been one of the keys to understanding the role of liquid water in the planet's past, which will help scientists learn if life ever existed there. Impressively, Opportunity has achieved the record of traveling the longest distance on another planet and continues to send back never before seen images of Mars.

While it may be a fixer-upper after spending over a decade in harsh Martian conditions, it remains a crucial asset to NASA as well as our understanding of Mars. After 12 years, Opportunity pushes onward.

## **Take a Look – ASME e-Learning Courses. Here is one Example:**

### *Introduction to the Selection of Pumps*

**Availability:** Always Online

**Member Price:** \$195.00

**List Price:** \$195.00

**PDHs:** 2.0

*This self-study course is designed to be taken at your convenience, and on your own schedule. You have **90 days** to finish the course once you begin.*

This course provides an introduction to pumps – the way they work, different types, and some basic applications. It discusses the flow of fluids through pipes, as well as the variables that affect the flow, and it takes a close look at centrifugal and positive displacement pumps.

#### **After this course, you will be able to:**

- Identify different types of pumps, including centrifugal and positive displacement pumps
- Recognize the advantages and the limitations of each type of pump
- Calculate the flow of liquid through piping systems
- Calculate the pressure drop in pipes, valves, and fittings
- Select the appropriate type of pump for a specific application

#### **Course Outline**

Module 1 – The Flow of Fluids

Module 2 – Centrifugal Pumps

Module 3 – Positive Displacement Pumps

**Who should attend:** This course is designed for anyone who wants an introduction to and a basic understanding of the types of pumps and their applications.

• Course Type: **Assessment Based Course**

• Course Number: **ZABC42**

Final invoices will include applicable sales and use tax.

See <https://www.asme.org/products/courses/introduction-the-selection-of-pumps> for complete details.

### **Chair's Corner**

To those who were able to join us for last month's discussion of new drone (unmanned aircraft) technology and pending FAA registration changes – I trust you enjoyed this timely and relevant presentation. Hope that you will be able to join us this month annual Engineering Banquet, member recognition, and program. All ASME-Central Oklahoma Section members, SWE Section member, AIAA Section members, students, and guests are welcome to join us. See you there!

Thanks much,

Tom Betzen, Chairperson, ASME Central Oklahoma Section

### **Future ASME-Central Oklahoma Section Events**

<b>Date</b>	<b>Location</b>	<b>Program Topic and Speaker</b>
Saturday Febr. 20, 2016	Okla. City Comm. College 7777 S. May Ave., OKC	Central Okla. Regional MATHCOUNTS Competition See <a href="http://www.mathcountsok.org/index.php/volunteers/central-region">http://www.mathcountsok.org/index.php/volunteers/central-region</a> to volunteer.
Tuesday Febr. 23, 2016	Okla. Science Museum 2100 NE 52 <sup>nd</sup> St, OKC	OEF Engineering Fair See <a href="http://www.oef.org/volunteers/engineering-fair-volunteers">http://www.oef.org/volunteers/engineering-fair-volunteers</a> to volunteer
Thursday Febr. 25, 2016	Gaylord Student Center OC Campus, Edmond, OK	Joint Engineering Societies Banquet SPEAKER: Col. Charles M. Gaona, USAF Deputy Director of Engineering and Technical Management at TAFB
Thursday March 24, 2016	C. H. Guernsey & Co. 5555 N. Grand Blvd. Okla. City, OK	Annual Ethics Meeting SPEAKER: George Gibson
Thursday April 28, 2016	TBD	Annual Honors & Awards Meeting with the Oklahoma SWE Chapter SPEAKER: Conni L. Eckstein

**Please visit our Section website:**

[https://community.asme.org/central\\_oklahoma\\_section/default.aspx](https://community.asme.org/central_oklahoma_section/default.aspx)

**IT'S BEEN REVAMPED.** Check event updates and other useful information!

### **NOTE**

**The 2016 ASME COS Engineering Scholarship is attached after this page.**

# ASME Central Oklahoma Section Engineering Scholarship Application

***E-Mail or Postmark Deadline: March 31, 2016 - Please follow-up e-mail applications with a mailed signed copy***

Applicant: \_\_\_\_\_  
Last Name First Name Middle Initial

Home Address: \_\_\_\_\_  
Street Address Apt No.

\_\_\_\_\_  
City State Zip Code

Telephone: (\_\_\_\_) \_\_\_\_ - \_\_\_\_\_ (Ext \_\_\_\_)

ASME Student Member\* #: \_\_\_\_\_

E-mail: \_\_\_\_\_

Attending University: \_\_\_\_\_  
(Central Oklahoma Institution with ABET Accredited Program Only\* - See Below)

### **\* APPLICATION RULES & AWARD REQUIREMENTS \***

***Applicants must be in their Sophomore or Junior year when applying and enrolled full time (12 Credit Hrs per Semester Minimum) in a Mechanical Engineering or Mechanical Engineering Technology Degree Program at the following Oklahoma ABET accredited Universities within the Central Oklahoma Section's Geographic Area:***

***The University of Oklahoma in Norman, Oklahoma State University in Stillwater, & Oklahoma Christian University in Edmond.***

***Applicants must be members of their University's ASME Student Section to be eligible for a grant under this scholarship program. If you are not currently an ASME student member, you must be a member in good standing by the time of application submission.***

***Grant recipients must be ASME student members and be fully enrolled in a Mechanical Engineering or Mechanical Engineering Technology curriculum during the semester of their award. Those whose qualifications change during the award semester will be disqualified and have their grant rescinded and re-directed to the runner-up candidate.***

***Grant recipients are requested to keep their address information (residential and/or e-mail) current to allow the Central Oklahoma Section to contact them in the future to gage the outcome of their education, for statistical feedback purposes.***

### **ACADEMIC OR PROFESSIONAL REFERENCE INFORMATION**

Name: \_\_\_\_\_ ASME Member (Yes/No): \_\_\_\_\_

Title, Employer: \_\_\_\_\_

Address: \_\_\_\_\_  
Street Address Apt No.

\_\_\_\_\_  
City State Zip Code

Telephone: (\_\_\_\_) \_\_\_\_ - \_\_\_\_\_ (Ext \_\_\_\_)

E-mail (if known): \_\_\_\_\_

Connection/Relation to Candidate (Parent/Advisor/Employer/Mentor): \_\_\_\_\_

### **ACADEMIC DATA SUMMARY**

Academic Course Hours Completed: \_\_\_\_\_ Current GPA: \_\_\_\_\_ Major: \_\_\_\_\_

Currently Enrolled Course Hours: \_\_\_\_\_ Expected Graduation Date: \_\_\_\_\_

***Please attach a current transcript or complete college grade record: either an original, official transcript with embossed seal/stamp or a printed (unofficial) copy signed by your ASME Advisor.***

**Fill in the Student Activities Information on the next sheet. complete with your dated signature.**





## ASME Central Oklahoma Section Engineering Scholarship Application - *Financial Data*

Applicant: \_\_\_\_\_  
Last Name
First Name
Middle Initial

**Estimated Annual Financial Data (from 1 June 2016 through 31 May 2017)**

Annual Sources of Funds	Amount	Annual Tuition & Expenses	Amount
Job Income	\$		\$
Student Loans	\$		\$
Other Scholarships/Grants	\$		\$
Support from Parents/Family	\$		\$
Personal Savings	\$		\$
Other	\$		\$
<b>Total</b>	<b>\$</b>	<b>Total</b>	<b>\$</b>

These figures reflect my financial situation accurately and completely.

\_\_\_\_\_

Applicant's Signature

\_\_\_\_\_

Date

Please note: this page must be submitted TOGETHER WITH the **Application Form** and **Evidence of Attendance & Academic Performance**, to form a complete application. Do not send this page separately!