NEWSLETTER

2008, 2012, 2017 President's Award for Most Outstanding Chapter

Gold Circle Award 2004-14

Platinum Circle Award 2015-17

Third Quarter Strategic Planning Meeting
By President Dr. Rick Hefner

The Chapter's third quarterly Strategic Planning Meeting (SPM) was held on August 11, 2018. The SPM is an opportunity to review plans and accomplishments, and to brainstorm ideas for increasing value to our membership. Both elected and appointed officers are invited, along with members at large.

A major portion of the meeting was devoted to discussing ways to increase membership. Since the majority of our budget comes from our membership-based allotment from INCOSE International, maintaining our membership is key.

The group discussed special newsletters, company ambassadors, broader support to student divisions, and groups, more tutorials, social media, networking events and expanding our remote sites. Of particular concern is retaining those members who decide not to renew their national membership. The general consensus is that we need to better explain the value of INCOSE membership (see the President's Column), and we need to continue provide strong value for our members.

Interested in learning more and contributing to the direction of the Chapter? Please join us for the fourth SPM on Saturday, November 11, 2018. More details are on the back page and a Reflector Notice will be sent out in a few weeks.

Go to the President's Column on page 3
What is the Value of Membership? — Some Answers

2019 Elections Meet the Candidates

INCOSE-LA is happy to announce the slate of candidates running for office on the INCOSE-LA Board for 2019. Voting is expected to open November 1 and close November 31. You will receive an email. The candidates are:
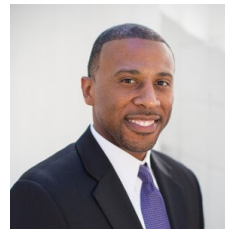
President: Dr. Mark McKelvin is the current Vice-President of the Chapter. Mark's background includes a broad spectrum of experiences and contributions to the profession.

Dr. McKelvin is a Senior Engineering Specialist in systems and software engineering at The Aerospace Corporation. Dr. McKelvin specializes in the use of model-based engineering techniques to develop solutions to architecture design challenges in cyber-physical and software-intensive systems. He is also a Lecturer in Systems Architecting and Engineering Program at the University of Southern California, Viterbi School of Engineering where he teaches courses on Model-Based Systems Engineering and Systems Engineering Theory and Practice. His interests are in the application of modeling, analysis, and design of engineered systems, including cyber-physical, embedded, and software systems. He holds a Ph.D. in Electrical Engineering and Computer Science from the University of California Berkeley with an emphasis in Electronic Design Automation.

Inside This Edition

Vice-President:

Mark TenEyck is the candidate for Vice-President. Mark has been an active contributor to the Los Angeles Chapter. He is currently serving on the Board of Directors as the Programs Director and has previously served the Chapter as the Membership Director. Mark has been instrumental in many special activities for the Chapter. Most recently he supported the Western States Regional Conference by facilitating one of the remote sites for the Systems Engineering Professional Development Day.

Mark is an accomplished business executive with 30 experience in management, design, fabrication and building. He started his first business at the age or 19 in residential home building and design. He transitioned to a career with Dassault Systèmes, his current employer. Mark's enthusiasm carries over to his work in the community with activities such as teaching in Boyle Heights and mentoring First Robotics Teams.

Secretary:

Phyllis Marbach is the current Secretary of INCOSE-LA. She was the President of INCOSE-LA in 2017 during which time the Chapter was awarded the Platinum Award and the President's Award. Phyllis retired from The Boeing Company Defense Space and Security Division as a senior software engineer in 2016. She has over 35 years of experience in aerospace programs including satellite ground stations, chemical lasers, the International Space Station, and various propulsion systems. Phyllis has held several positions at Boeing including Systems Engineer, Project Engineer, Manager and Software Engineer. She was a Boeing Designated Expert in agile software development, software engineering and systems engineering. The past eight years in her role as an Agile Coach for Boeing, she coached commercial airplane, unmanned air systems, radio, avionics, and research programs. Currently she is a Scaled Agile Framework™ 4 Program Consultant and Immediate Past President of the International Council on Systems Engineering (INCOSE) Los Angeles chapter, the second largest chapter in the United States. Phyllis is currently consulting with Giant Magellan Telescope Organization in Systems Engineering Best Practices and agile transformation. Phyllis has a Master of Science degree in engineering from the University of California – Los Angeles.

Treasurer:

Lin Yi is a level III technologist at Jet Propulsion Laboratory, California Institute of Technology. He is responsible for scientific research, technical leadership, system engineering and project management in multiple precision timing and frequency related projects/missions of NASA and DARPA. His expertise lies in areas of atomic clocks, GNSS and deep space navigation, ultra-fast and deep UV laser engineering, precision instrumentation and measurement, software engineering, embedded system architecture, frequency and timing metrology, atomic, molecular, optical and plasma physics. Dr. Yi has published more than 30 peer-reviewed journal articles and conference papers. Dr. Yi -holds leadership positions in professional organizations such as IEEE, IEEE-UFFC-S, INCOSE-LA. Dr. Yi serves as technical reviewer for NSF, NASA, OSA, IEEE, AIP, IOP, USRA.

Lin is currently serving as the Treasurer of the Chapter.

Director of Communications:

Scott Birtalan has volunteered for the LA Chapter since he joined INCOSE in 2010. He began as a member of the Networking Committee helping to organize fun and casual events for the local systems engineering community. Since then Scott has taken the lead on networking and subsequently filled the Student Division liaison role.

Scott has been employed at Northrop Grumman in the LA area since 2002. Working in the area of Operations Analysis initially, he has rotated through both leadership positions and varying technical positions, working to broaden his knowledge of systems engineering, software product management, project management, and, particularly, aircraft systems applications. Scott is currently located at Northrop's Camarillo facility working as a Project Manager supporting the Naval Air Warfare Center at Point Mugu on airborne payload software sustainment programs.

Scott's educational background is in Aerospace Engineering with a B.S. from Cal Poly San Luis Obispo. His Systems Engineering education is from USC with a M.S in Operations Research. He has also has attended the Cal Tech Project Management Course, the Cal Tech Agile Project Management Course, and has practiced as an INCOSE Certified Systems Engineering Professional.

When Scott isn't working he spends his free time hiking and backpacking in the local mountains, participating in plenty of fitness activities, and roving the streets of LA for fantastic food.

Not a member? Join INCOSE!

Learn more about becoming a member by going to the INCOSE homepage at https://www.incose.org/

Director of Ways and Means:

Stephen Guine is a long-time leader and contributor to the Los Angeles Chapter and is currently serving on the board as the Director of Ways and Means. Stephen is a Past-President of the Chapter and has supported the Chapter by taking on special projects such as rewriting the bylaws and contributing his wisdom to the meetings of the Board of Directors. In the professional realm Stephen is a leader of the implementation of systems engineering at Northrop Grumman and has taught at the University of Southern California.

Director of Systems Engineering Training:

This opportunity was still open when the *Newsletter* went to press.

Program Director:

This opportunity was still open when the *Newsletter* went to press.

The success of the Los Angeles Chapter is driven by two things: our officers and our members. INCOSE has acknowledged the Chapter with the Gold Circle Award every year since 2003 and with the Platinum Circle Award every year since its inception in 2015. The Chapter has received the INCOSE Presidents' Award for 2017, However, more important than the awards are the services and value provided to and available to the Chapter members.

For those who are not familiar with the process of our Chapter elections, an explanation: the BoD consists of a voting body and an appointed body. The voting body consists of ten positions, five of which are the Executive Officers and five of which are the At-large Directors.

The Executive Officers hold one-year terms while the At-large Directors hold two-year terms. The two-year terms are staggered to preserve Chapter knowledge from year to year.

The appointed body consists of managers and chairpersons who are recruited to execute specific functions such as producing the *Newsletter* or the Reflector.

It is now up to you, our members, to vote for the 2019 BoD. We proudly introduce to you our slate of candidates for next year's Board of Directors.

President's Column
What is the Value of Membership?
Some Answers
By President Dr. Rick Hefner

At a recent INCOSE-LA Strategic Planning Meeting, we were brainstorming ways to increase membership. Someone posed the question "What is the value in joining INCOSE?" (One might equally ask, "What is the value in joining INCOSE-LA?") It is a good question – and there are several good answers, depending on your personal objectives.

Increase your value to your employer by expanding your skills and knowledge. In today's fast moving business landscape, becoming a life-long learner is a necessity. Systems engineering is rapidly changing, with new areas like resiliency, agile, and MBSE, and lots of new applications in the transportation, energy, and medical fields. INCOSE monthly meetings, tutorials, and conferences provide a chance to learn the latest techniques from industry experts. And INCOSE has numerous publications – free to members in the INCOSE Store.

Expand your network of professional colleagues. Almost every job offer I ever got came from someone outside my direct reporting chain. INCOSE activities (monthly meetings, working groups, conferences) provide an opportunity to meet potential new employers. If you're looking for a mentor, you'll find many of us willing to share our time and advice.

Contribute to the field. Sharing what you've learned with others can be incredibly rewarding. We are always looking for members who want to communicate their ideas through monthly meetings or tutorials. Or maybe you'd enjoy the pleasure of being a mentor!

Build your teamwork and leadership skills. Volunteer opportunities abound, both at the Chapter and nationally. Got a passion? We can carve a position tailor-made to the level of involvement you want.

Have fun. Yes, it take a special person to have fun hanging out with systems engineers! But many of us do, and make lifelong friends and colleagues.

So please consider where you'll getting the full value of your membership. Engage (and encourage others to do so as well). After all, systems engineering is a team sport!

San Diego Chapter Mini-Conference

This year's conference will center on the transformation of system engineering in addressing the increasing complexity and the shorter time to market of today's systems. This is another opportunity for systems engineering professionals to advance their knowledge of the discipline and to contribute to the advancement of the profession.

WHERE: San Diego **WHEN**: all day Saturday, December 1, 2018

CALL FOR ABSTRACTS: Please send a two-paragraph abstracts by **Sunday, October 14, 2018**, to the point of contact: Howen Fernando, hqfernando@gmail.com, (619) 508-0536

A Reflector Notice will be sent out with supplemental details, including cost and venue. The Call-for-Papers flyer is available at: https://sdincose.org/wp-content/uploads/2018/09/2018_INCOSE_Mini-Conference_Call_for_Abstracts.pdf

MODELING AND SIMULATION OF DISTRIBUTED HUMAN-AGENT TEAMS
October Speaker Meeting

The October Speaker Meeting will be held Tuesday, October 9, 2018. The meeting will begin at 5:30 p.m. The host venue will be The Aerospace Corporation facility in El Segudo (details below).

ABSTRACT:

A shift toward urban and asymmetric warfare is pushing the Army toward distributed autonomous systems. They must be adaptable, mobile, and resilient. Among these are systems of multiple collaborating robots, such as drone swarms. In future missions, humans and autonomous assets will be working in coordinated teams at nearly the same level of authority. The effects of human interaction with automation are often unintuitive and may complicate the design of such systems.

The Army Research Lab's Technology Development and Transition Team (ARL TDT) seeks to solve these issues through the use of agent-based modeling and simulation, to enable prediction of system-of-system performance at early design stages. This enables simulation of different mixtures of humans and autonomous agents spanning the design space of possible systems. As a motivating case study, a model and simulation of a multi-operator, multi-UAV surveillance team is presented. The model of human performance dynamically adjusts for fatigue, workload, and task difficulty. Coupled with physical models of quadcopter and fixed-wing UAVs, this establishes a platform for predicting system capability as a function of human team size, UAV team size, mix of diverse UAV types, and hardware quality.
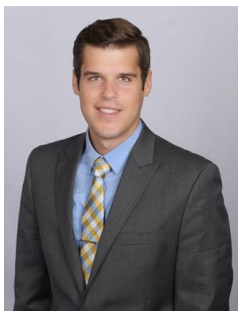
The simulation can be previewed at:

Caution-Caution-https://www.youtube.com/watch?v=IxSaexuccbI < Caution-Caution-https://www.youtube.com/watch?v=IxSaexuccbI >

A brief introduction to Army Research Lab - West, established in Playa Vista in 2015 to engage with local universities and industry partners, will also be presented.

BIOGRAPHY:

Dr. James Humann is a postdoctoral fellow at the US Army Research Lab. He earned an MS and PhD in Mechanical Engineering from USC, with an emphasis on design and systems engineering, and a BS in Mechanical Engineering from the University of Oklahoma. His current research focuses on agent-based modeling of distributed systems-of-systems including human, manned, and unmanned assets. He is an INCOSE-LA member and has presented at CSER and IEEE SysCon.

Dr. James Humann

The 2018 Ig Nobel Prize winners in medicine: Marc Mitchell and David Wartinger, for using roller coaster rides to try to hasten the passage of kidney stones.

DETAILS:

VENUE:
The Aerospace Corporation
El Segundo, California

SCHEDULE:
5:15-5:30 Sign-in/Registration
5:30-6:00 Networking/Refreshments
6:10-6:20 Introduction
6:20-6:30 WG Presentation (TBD)
6:30-7:30 Guest Speaker Presentation

DATE: Tuesday, October 9, 2018

COST: Free for members, $10.00 for non-members; light refreshments will be provided

REGISTRATION:

http://events.constantcontact.com/register/event?llr=l4ihvgeab&oeidk=a07efkesufzb11df376

DIRECTIONS TO THE AEROSPACE CORPORATION

Location: between Imperial and El Segundo Blvd (north to south), between the 405 Freeway and Sepulveda (east to west).

From the San Diego (405) Freeway heading SOUTH:
1. Take the exit towards El Segundo Blvd.
2. Turn Left onto S La Cienega Blvd.
3. Take the 1st Right onto W El Segundo Blvd.
4. Take the 2nd Right onto N Aviation Blvd.
5. Bldg. D8 will be the third building on the right, just past the discount bakery.

From the San Diego (405) Freeway traveling NORTH:
1. Take the El Segundo Blvd exit, Exit 44.
2. Turn Left onto W El Segundo Blvd.
3. Turn Right (North) on N Aviation Blvd.
4. Bldg. D8 will be the third building on the right, just past the discount bakery.

From the 105 Freeway traveling WEST:
1. Take the exit towards 405 South
2. Before getting onto the 405 Freeway, take the El Segundo Blvd exit.
3. At the bottom of the ramp, turn left (west)
4. Turn right on Aviation Blvd.
5. Bldg. D8 will be the third building on the right, just past the discount bakery.

The facility is the third building from the corner of Aviation and El Segundo, just north of the discount bakery. Only the southern-most gate of the facility is open. Identify yourself to the security guard as attending the INCOSE meeting. You can park where Security directs and enter through the lobby at the center of the building near the flag poles. Knock on the first of the double doors, and someone will open the door for you. The handicap ramp is on the north side and can be reached by driving all the way around the back of the building. Inform the security guard if you plan to use that ramp.

Dr. Scott Jackson was the featured speaker at the August Speaker Meeting. Dr. Jackson, an INCOSE Fellow, is a member of a team of distinguished Fellows (Hillary Sillitto, Dov Dori, Dorothy McKinney, Daniel Krob, Patrick Godfrey, Regina Griego, Eileen Arnold, and James Martin, in addition to Scott), and his presentation was a report on the activities of the team.

Dr. Scott Jackson

The team, "a task team of INCOSE Fellows [took on the task] to write a white paper that contains a definition of systems engineering that reflects the consensus of INCOSE Fellows." "The purpose of this white paper is to distill the discussion of the definition of systems engineering so it is constructive and helpful to both systems engineering practitioners and to those INCOSE is reaching out to educate about the value of systems engineering." The project was launched by the INCOSE leadership during the 2016 International Symposium and Dr. Jackson's presentation on the progress of the project included a presentation made the preceding week to the International Federation for Systems Research (IFSR) in Linz, Austria. Part of the challenge the team recognized was a need to look at definitions of "System" as well as "Systems Engineering." Scott's presentation was based on the team's draft recommendations to date plus outputs of IFSR.

Part of the challenge the team undertook was defining system. As so many professionals in the discipline well know, that "definition" can be challenging and is the subject of many discussions. Dr. Jackson methodically reviewed the challenges in developing such a definition, culminating with the observation, "we don't agree on what is and is not a system!"

Wending his way to this observation, Scott included the current definition of a system from the current (Fourth) edition of the "Systems Engineering Handbook:"

"...an integrated set of elements, subsystems and assemblies that accomplish a defined objective. These elements include products (hardware, software, firmware), processes, people, information, techniques, facilities, services, and other support elements."

The team's critique noted that the textbook definition is couched in terms of "real" systems:

- Restricted to purposeful human-made systems, excludes naturally occurring systems (since these don't have an 'a priori' defined objective
- Does not include naturally occurring elements
- Does not recognize that system is an open system which accomplishes its defined objective by interacting with wider context or environment
- Does not recognize that unintended consequences may arise from unintended interactions
- Not compatible with wider system science definitions – limits knowledge transfer.

From the above analyses, the team established a consensus of INCOSE Fellows defining a "system:"

A system is a construct of collection of different elements that together produce results not obtainable by the elements alone. The elements, or parts, can include people, hardware, software, facilities, policies, and documents; that is, all things required to produce systems-level results.

The results include system-level qualities, properties, characteristics, functions, behavior, and performance. **The value added by the system as a whole, beyond that contributed independently by the parts, is primarily created by the relationship among the parts; that is, how they are interconnected (Rechtin, 2000).**

Their review of hundreds of definitions of "system" found that the definitions tended to cover one or more of three aspects:

1. System **IS**: structure; e.g. multiple interacting or inter-related elements
2. System **DOES**: functional or behavior; e.g. does things the parts can't do on their own
3. **WHY**: purpose
There is a caveat that "purpose" can only be safely attributed to deliberately constructed "artificial" systems.

Dr. Jackson noted that team identified seven "worldviews:"

1. Systems occur in the "real" (physical) world
2. Systems are mental constructs
3. Systems may consist of pure information
4. System boundaries are designated by the observer
5. System boundaries are discoverable based on objective criteria
6. Systems are "parts standing in relation"
7. Systems have complex dynamic properties.

It was at this juncture that Dr. Jackson presented the aforementioned observation, "we don't agree on what is and is not a system!" Scot then shared the seven different worldviews on "system" within the INCOSE community:

1. A formal minimalist view based on mathematics and logic
2. Constructivist -systems are purely a mental construct; systems are purely a mental construct;
3. Moderate realist– systems exist in physical and mental "worlds"
4. Strong and Extreme Realists – systems only exist in physical world
5. Complex, viable and living systems Miller, 1978; CAS, etc.
6. Systems as a Mode of Description – Aslaksen, 2013
7. System as a process – process, rather than object/ structure, is the essence of systems: Blockley, 2010, "Process Philosophy."

Next in Dr. Jackson's presentation was a cataloging of properties of a system. The Systems Science Working Group was polled, and the poll resulted in the identification of eighteen properties. Scott presented the results of the poll, and highlighted the four which were cited most frequently:

1. Relationships between the parts
2. Interactions between the parts
3. More than one part
4. "Emergent properties," properties of the whole system not possessed by the individual parts acting separately.

The information on the chart could well serve as a basis for debate, particularly in terms of the "rankings" reflected in the poll. A "boundary" was fifth, and "purpose" was tied for last.

Dr. Jackson progressed through a series of Venn diagrams to illustrate the relationships of the world views and the challenged faced by those of us in the profession. He concluded with a series of insights and observations with respect to the challenge and a summary of the direction that INCOSE and the systems engineering profession needs to follow.

The charts used by Dr. Jackson are available in the Chapter's Collaboration Portal (nee "connect") site, and are to be highly recommended. Space, and other limitations, prevent this article from giving Dr. Jackson's excellent and comprehensive presentation the justice it deserves.

SoS: Are We Being Hasty?

By Jorg Largent

The concept of "System of Systems" is a powerful tool born of necessity. High and higher speed computer chips, the Internet-of-Things, novel applications, and their use has dramatically challenged the application of the systems engineering discipline. But is the concept of a "system of systems" truly novel?

A parking meter was cited as example. Parking meters have been annoying spires on the curbs of city street for decades. But the modern parking meter cannot be considered a standalone system, hence the argument that even the lowly parking meter is a system of systems.

In counterpoint it can be argued that in 2018 the parking meter is as much a "standalone" system as it was in 1968. The basic function is unchanged: collect money for the use of a parking spot. In 2018 this can be done with a credit card and some sort of internal device connected to the internet, but that is not a change in the original requirement, that is a change in the facilitation of the requirement.

Other functions, such as facilitating parking enforcement, are new requirements for the parking meter (requirements creep). There is certainly a capability to have the parking meter use a camera to "watch" a parked car in the corresponding parking space and to promptly issue a parking ticket to the "dastardly" citizen who overstays the permitted period of time.

However, the discipline of systems engineering came about as a means of dealing with changes such as these.

Consider the airplane. The Wright brothers did not use radios. The number of airplanes grew, and with this growth came a need to communicate. It should be noted that airplanes could operate without radios as recently as the 1960s. To deal with the need for better communications, the aviation industry came up with a systems of signal lights.

This particular safely need to "keep your head out of the cockpit" was a functional requirement from the first flight of the second airplane. Certainly, by the beginning of World War II colored lights were proving inadequate, so the aircraft operators took advantage of radio. Radio was a technological step forward on a scale comparable to the impact the internet has had in the Twenty-first Century.

Interface control became an issue. There had to be agreement between the airports and the aircraft which radio frequencies would be used by whom and for what purpose. The Federal Communications Commission and the Federal Aviation Administration provided the necessary interface control in the United States.

This then led to a system of systems. The airplane is a system. The radio in the airplane is, from the airplane perspective, a subsystem. As such, it has certain functional and interface requirements. The radio, from the perspective of the radio manufacturer, is the top-level system and is composed of subsystems such as a transmitter, receiver, and antenna. The radio manufacturer has to comply with the interface requirements of the aircraft plus the interface requirements of the FCC and FAA.

The use of radio frequency devices and electronic switching logic on aircraft facilitated a tremendous growth in aviation. These advances brought with them increased complexity and the term "sneak circuit" became a part of the lexicon by the 1960s. Vacuum tubes, transistors, and computers contributed to dramatic changes in the same timeframe. Paralleling these leaps in technology was systems engineering's coming of age – a transition from the intuitive to a discipline, distill by the rigors of academia.

This snapshot of our history should serve as a reminder of the value of what we, as a profession, have built. Thomas Feldman, in his book, *The Earth is Flat*, discusses what we have all seen over the last twenty years: a headlong rush to change, and change as fast as possible. While the application of Agile to systems engineering addresses the challenge of keeping the herd headed in the right direction, society, and the technologies feeding the pell-mell rush to change, is swept up in a fascination with "what can it do" versus "what should it do" and "why?" Our profession is the only discipline designed to face the challenge. Let us not throw out the baby with the bath water.

The 2018 Ig Nobel Prize winners in biology: Paul Becher, Sebastien Lebreton, Erika Wallin, Erik Hedenstrom, Felipe Borrero-Echeverry, Marie Bengtsson, Volker Jorger, and Peter Witzgall, for demonstrating that wine experts can reliably identify, by smell, the presence of a single fly in a glass of wine.

The Martian Curiosity Rover and our Future Systems Engineers
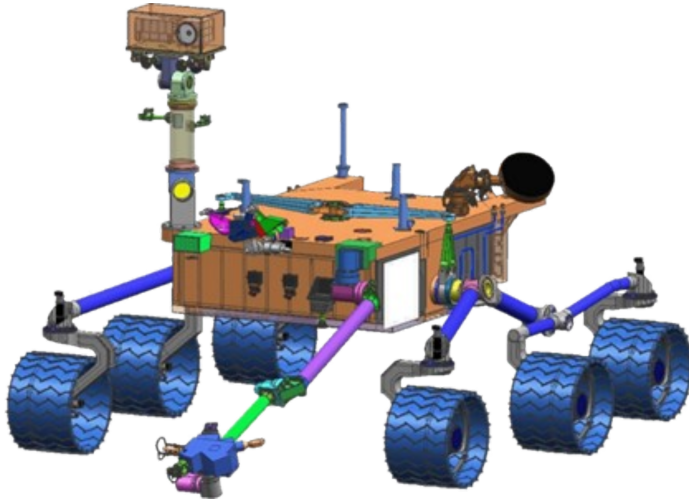
Following in the footsteps of the Science, Technology, Engineering, and Math (STEM) event last year, we can look forward to the seventh annual event this year on October 13, 2018, from 1:00 p.m. to 5:00 p.m. The venue will be the same as in the past: the S-Café of the Northrop Grumman Corporation. The facility is in Redondo Beach, south of Marine Ave at Simon Ramo Drive.

This outreach to students in the Los Angeles area is sponsored by several professional societies, including INCOSE-LA, and several other prominent aerospace organizations.

The Curiosity Mars Rover continues to prowl the red planet, and this event will feature the latest information, and engineering and science results. There will be a scale model of the landing site along with a selection of hardware and mock-ups.

As was done last year, there will be a variety of activities to entertain the students while piquing their interest in science and engineering. Last year the students enjoyed themselves like a litter of pups with a new squeaky toy. The adults enjoyed the event as well, albeit in a more staid manner. Also, as was the case last year, free bottled water and healthy snacks will be provided.

Members who would like to support INCOSE-LA's participation should contact Fred Lawler at fredlawer@hotmail.com.

For registration and additional information, go to the webpage for the event: https://tinyurl.com/2108mars

COST: FREE (parking and admission)!

If you can spare a few hours on a Saturday afternoon, this is an opportunity for members to volunteer, telling people about systems engineering and INCOSE. To learn about the event last year and the contribution of INCOSE-LA, read the October, 2017 edition of the *Newsletter*, available through the Chapter webpage. Contact Phyllis Marbach (prmarbach@gmail.com) to volunteer and to participate in this invigorating event. As more details become available, they will be published in the *Newsletter* and posted on the Chapter webpage.

Student Division Sponsorship
By Scott Birtalan

Did you know the LA Chapter sponsors three student divisions in the Los Angeles and Orange County area? Starting in 2012, with the kickoff of the University of Southern California division, INCOSE-LA has been sponsoring student divisions as part of the greater INCOSE outreach mission. Since then Loyola Marymount University and Cal Poly Pomona have joined with the Chapter to enhance our student-industry partnership in systems engineering.

INCOSE student divisions operate as fully self-sufficient student organizations, providing leadership opportunities to their members and mentor and protégé relationships with both university faculty and INCOSE-LA liaisons. Student members gain access to all of the typical INCOSE resources, while taking part in ongoing local area chapter events. Students plan and execute their own activities with chapter sponsorship. Past events have included on campus speaker programs and young professional networking with other local area industry group student organizations. Student participation is also one of the key discriminators in our Chapter's sponsorship of the recurring Conference on Systems Engineering Research.

We're looking forward to introducing INCOSE's newest student division in the fall when Cal State Long Beach joins us. Keep an eye out for more news and future opportunities to participate as the Los Angeles Chapter and some of our top local universities continue our partnership for systems engineering excellence.

The Critical Infrastructure and Recovery Working Group (CIPR) is but one of many working groups within INCOSE. These working groups work on the application of systems engineering in focused areas of need and concern. Josh Sparber, a member of the Los Angeles Chapter, is also a member of the CIPR WG and submitted the following report from Mitchell C. Kerman, Ph.D., chairman of the group. [Ed.]

- We are recruiting! We have an open spot for the INCOSE CIPR WG logistics co-chairperson. If you have an interest and are willing to volunteer, please contact Mitchell Kerman at mitchell.kerman@inl.gov.
- EnergyTech 18 will occur October 22 — 25, 2018 in Cleveland, Ohio. Go to https://www.energytech.org/ for information on becoming a sponsor, presenter, or attendee. If you have any questions, please contact Mitchell Kerman or John Juhasz for details.
- Work on the Microgrid Reference Model and on the Resilient Hospitals work is continuing, but has stagnated somewhat over the summer months. We are looking for the team to re-engage early this Fall.
- We are still working on the *CIPR Primer*.
- We are still planning on a CIPR-themed volume of INCOSE *INSIGHT* to be published in the Fall of 2019.
- There has been extensive discussion regarding the working relationship between InfraGard and the working group:
    - The working group can provide System of Systems modeling to improve the resilience of CIPR
    - The working group can (and expect to) author a systems-oriented text in InfraGard's publication, *Powering Through 2.0*.
    - The working group can provide hyperlinks to INCOSE CIPR information for the eBook version of *Powering Through 2.0*.

We have approval to create a $2,000.00 annual "CIPR Award" from the Working Group to a graduate student. This is a recurring competition to be awarded each academic year. The intent is to better engage university professors and their students in INCOSE and CIPR research areas. The competition is open to any university so long as student is an INCOSE member. The announcement and competition forms are in work. The Working Group is looking for judges to help determine the winner. The first award is to be awarded this Fall.

We ended with a healthy discussion as to how we (as INCOSE) can accept money for CIPR tasks. Rather than paying people as employees (which may be difficult), these funds would be used to host workshops and other events, travel to relevant meetings, etc. The INCOSE Foundation is one possibility, and thew Working Group is in contact with the Foundation.

EnergyTech, the CIPR WG and INCOSE

EnergyTech 18 is the annual EnergyTech conference and exposition, organized and supported by NASA and INCOSE. The conference highlights advancements in energy, smart-grids and microgrids, as well as aerospace, critical infrastructure, security and policy. In 2018 the organizers expanded their collaboration with professional societies including InfraGard, IEEE, SAE, AIAA, PMI, and others. The organizations are working as a team with a mission of advancing the technology and system integration of these complex domains, and of managing the risk scenarios confronting civilizations.

The CIPR WG, the FBI, InfrGard and National Security

InfraGard is a partnership between the FBI and members of the private sector. The InfraGard program provides a vehicle for seamless public-private collaboration with government that expedites the timely exchange of information and promotes mutual learning opportunities relevant to the protection of Critical Infrastructure. With thousands of vetted members nationally, InfraGard's membership includes business executives, entrepreneurs, military and government officials, computer professionals, academia and state and local law enforcement; each dedicated to contributing industry specific insight and advancing national security.

September Speaker Meeting: Lessons from 9/11
By Karen Grothe

On the 17th anniversary of the largest terrorist attack on United States in recent history, Dr. William Good came from Colorado to explain the need to mitigate the risk of unconventional terrorist attacks. Dr. Good offers a solution to the detection and tracking of non-obvious weapons of mass destruction (WMD). As Senior Vice President of The Cameron Group, he is guiding the Vehicle -Based Threat Detection System (VBTDS) through the process of full development and deployment across multiple non-government vehicle types within the private sector.

Dr. Good recently worked in Missile Defense. He explained that missiles leave "calling cards", a way to identify where they came from, and thus present the possibility of retaliation. Non-obvious WMDs, on the other hand, leave no such calling card and are difficult to detect. Commercial aviation attacks illustrate the dangers of WMD threats, such as the Pan Am 103 bombing in December 1988 (a.k.a. the Lockerbie bombing) in which a plastic explosive was likely loaded onto the airplane in a suitcase. The security of cargo, particularly cargo coming from outside the U.S., is suspect given the number of reported hazardous materials (hazmat) incidents that are caused by undeclared hazmat and the frequency of cargo theft. A WMD might be hidden in a pre-packaged pallet or placed inside shipping crates. The Metrojet Flight 9268 explosion in 2015 may have been caused by a soda can bomb placed by a baggage handler, demonstrating the possibility that an inside job might be accomplished through bribery or coercion of local personnel.

Cargo coming into the U.S. is inspected upon landing, but what if the terrorists' intention is to deploy a WMD over a city before the airplane lands? The Cameron Group's VBTDS is a patented system for detecting WMD in a vehicle. It includes at least one sensor connected to at least one detector that detects chemical, biological, radiological, nuclear or explosive (CBRNE) weapons in the cargo holding area. A warning system communicates detection of a weapon to a location remote from the cargo holding area, such as the cockpit of an airliner. Beyond just protecting the vehicle passengers and cargo, the system seeks to protect the destination city, thus a communication network would be established to inform law enforcement in addition to the vehicle operator.

Because Dr. Good is a former USMC and commercial pilot, most of his talk focused on how the VBTDS would work on aircraft, but he emphasized that non-obvious WMD detection makes sense for any vehicle. The Cameron Group advocates mandating the use of the VBTDS on cargo aircraft.

For more information, see The Cameron Group's article "Cameron Vehicle-Based Threat Detection System (VBTDS) for WMD / Explosives in Air Cargo" at http://bit.ly/CameronVBTDS.

Dr. Good

An Update to the Chapter By-laws
By Past-President Stephen Guine

Based on the affirmative results of the recent membership vote, the Board of INCOSE-LA has updated the bylaws of our Chapter. In summary, the bylaw update does the following:

- Consolidated the Chapter Constitution and Bylaws into a single document, consistent with the current INCOSE practice.
- Incorporated common boilerplate language from the standard INCOSE bylaws is sections where it added clarity to previous language
- Clarified and updated the electoral process to make sure that all language is consistent with the use of technology to allow for shorter review periods and to identify which tools are acceptable for elections.

The bylaws are always available to members on INCOSE-LA on the INCOSE Connect site in the folder for our Chapter. Additionally, any and all members are encouraged to present proposals for bylaws modification to the Board for discussion at the quarterly Strategic Planning Meetings (open to all members) and eventual presentation to the membership at large.

Keys to Effective Chapters
By Tony Williams, Director, INCOSE Americas Sector

The "Keys to Effective Chapters" wiki is a repository of best practices, templates, guides, how-to, and tips gathered from award winning chapters to assist chapter officers in successfully managing their chapters. For the past few years it was hosted on Wikispaces, but has now been relocated to the INCOSE Collaboration Portal (Connect) for members only. Ellie Gianni, Past-President of the Chesapeake Chapter and a member of the Chapter Awards committee, set up the Wiki in Connect and moved the content. She also reorganized and updated the content and added new examples and guidelines. The current new location is in Connect/Chapters/Chapter Resources/Keys to Effective Chapters:

https://connect.incose.org/Chapters/HelpResources/_layouts/15/start.aspx#/Keys%20wiki

The Wiki should be accessible to all members for read-only and downloads. Chapter Officers have privileges to upload and edit content.

If you have outstanding best practices you would like to share, upload it to the wiki. Or you can send your additions and edits to ChapterKeys@incose.org. Use the same email for any questions or suggestions for content or for ease of use.

You will receive a follow-up with a few more details about the Keys to Effective Chapter wiki in a couple of weeks.

And huge thanks to Ellie Gianni for porting the data and Don Boyer for his tireless advocacy for the Keys wiki. This is a very valuable treasure trove for chapter leaders seeking to improve their chapters.

Name	Organization
Jim Young	Bruker
Mshary Alsaeidi	The University of Texas at El Paso (UTEP)
Dhari Alsaeedi	The University of Texas at El Paso (UTEP)
Bahman Zohour	Northrop Grumman Corporation
J. S. Shelley	AFRL/RQRC
Katherine Morgan	Embry Riddle Aeronautical University
Abdelrahman Aboulnasr	Embry Riddle Aeronautical University
Keith Coble	Kratos RT Logic
Michelle Dennison	Booz Allen Hamilton
Edwin Betady	Cal Poly Pomona
Clark Uhl	Cornell University
Roland Nilarp	
Mohammed Qasem	
Joshua Villalobos	
Eric Aceves	Loyola Marymount University
Mohammed Bukhalaf	Loyola Marymount university
Robert Fields	Loyola Marymount University
Eduardo Meidunas	SAIC
Enrico Sala	Loyola Marymount University
Sergio Valdez	Cal Poly Pomona Student Division
Thant Win Mya	Loyola Marymount University
Abdullah Abukhalaf	
Marwan Albeer	California State Polytechnic University, Pomona
Sultan Alzoabi	
Keith Murphy	Loyola Marymount University
Brandon Nguyen	Loyola Marymount University
Hilliard Paige	NASA Space Grant
Jared Pangelinan	Loyola Marymount University
Edward Round	Loyola Marymount University
Alex Sasser	Loyola Marymount University
Josh Bernardin	

But Wait!   There's More!

Name	Organization
Tim De Vries	Loyola Marymount University
Joshua Fuentes	Loyola Marymount University
Andres Gomez	Loyola Marymount University
Andrea Montes De Oca	Loyola Marymount University
Andre De Leon	Loyola Marymount University

You are invited to the INCOSE-LA Chapter Holiday Party!

5:30 p.m. Saturday evening, December 8, 2018

Location same as last year, at the elegant
Del Rey Yacht Club
13900 Palawan Way
Marina Del Rey

$30 for guests and non-members
Great people ❅ Fine food ❅ Lots of Fun
Entertainment: Engineer-Turn-Comedian Don McMillan
An INCOSE-LA Tradition!
Registration Required Attendance is limited!
Standby for a Reflector Notice
and more details in the next edition of the *Newsletter*

2018 Board of Directors

Elected Officers

Position	Name	Email
President	Rick Hefner	rhefner@caltech.edu
Vice-president	Mark McKelvin	Mark.l.mckelvin@aero.org
Immediate Past-president	Phyllis Marbach	prmarbach@gmail.com
Secretary	Phyllis Marbach	prmarbach@gmail.com
Treasurer	Lin Yi	Lin.yi.dr@ieee.org

Elected At-large Directors

Position	Name	Email
Membership	Karen Grothe	Ksgrothe@yahoo.com
Programs	Mark TenEyck	Mark.teneyck@3ds.com
Systems Engineering Education	Tony Magorno	tmagorno@gmail.com
Ways and Means	Stephen Guine	Stephen.Guine@ngc.com
Communications	Scott.Birtalan	scott.birtalan@ngc.com

Appointed Positions

Position	Name	Email	Position	Name	Email
Newsletter Editor	Jorg Largent	jorg.largent@incose.org	Student Division Ambassadors	Scott.Birtalan	scott.birtalan@ngc.com
Technical Society Liaison	Shirley Tseng	shirleytseng@earthlink.net	Reflector Manager	Deborah Cannon	Deborah.a.cannon@aero.org
Chapter Awards Manager	Rick Hefner	rhefner@caltech.edu	Social Media Manager	Doris Gebelein	doris.gebelein@lmco.com
Professional Networking Chair	Scott Birtalan	scott.birtalan@ngc.com	New Member Ambassador	Collette Kurtz	kurtz905@aol.com
Representative to the SF Valley Engineer's Council	Stephen Guine	Stephen.Guine@ngc.com	Volunteer Coordinator	Karen Miller	karmill888@aol.com

INCOSE-LA Chapter NEWSLETTER

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Forwarding Service Requested

The International Council on Systems Engineering (INCOSE) is a not-for-profit membership organization founded to develop and disseminate the interdisciplinary principles and practices that enable the realization of successful systems. INCOSE's mission is to share, promote, and advance the best of systems engineering from across the globe for the benefit of humanity and the planet.
The Los Angeles Chapter meets several times per year for speaker meetings and, in addition, sponsors tutorials, mini-conferences and other activities of interest to those in systems engineering or related fields.

UPCOMING EVENTS

For more information on these and other events of interest in the Los Angeles area, look for a Reflector Notice in your email, and check the Chapter website: www.incose.org/los-angeles . Like us on Facebook

PMI Global Conference
Weekend of October 5 — 8, 2018
Los Angeles Convention Center
S https://www.pmi.org/global-conference/about
See article on page 8

October Speaker Meeting
Modeling and Simulation of Distributed Human-Agent Teams
By Dr. James Humann
Tuesday, October 9, 2018
5:30 p.m. — 7:30 p.m.
The Aerospace Corporation
El Segundo, California
See page 5 for details; to register go to:
http://events.constantcontact.com/register/event?
llr=l4ihvgeab&oeidk=a07efkesufzb11df376

STEM Celebration Event
Saturday, October 13, 2018
The Children's Discovery Museum
Escondido, California
For more information and to register, see
https://sdincose.org/news/stem-explosion-2018/

Seventh Annual Mars, Curiosity, and STEM
Saturday, October 13, 2018
1:00 p.m. — 5:00 p.m.
The Northrop Grumman S-Café in Redondo Beach
See article on page 7

Fourth Quarter Strategic Planning Meeting
The members' opportunity to be heard and contribute
Saturday, November 10, 2018
9:00 a.m. — 3:00 p.m.
Manhattan Beach Community Church
Lunch included
No cost for members
Standby for a Reflector Notice in your e-mail

November Speaker Meeting
Tuesday, November 13, 2018
Details in work and a Reflector Notice will be e-mailed as they become available

San Diego Chapter Mini-Conference
Full day event, Saturday, December 1, 2018
See article on page 3

Annual Holiday Party
Saturday, December 8, 2018
5:30 p.m. — 7:30 p.m.
Del Rey Yacht Club
Marina Del Rey, California
See page 11 for details
Standby for a Reflector Notice in your e-mail