NEWSLETTER

INCOSE
LOS ANGELES CHAPTER

GOLD CIRCLE AWARD
2004-14

PLATINUM CIRCLE AWARD
2015

2008, 2012 President's Award for Most Outstanding Chapter

INCOSE
International Council on Systems Engineering

Braw Stories from Bonnie Scotland
By Jorg Largent

Past-president Stephen Guine "paid the piper" at the symposium banquet Thursday night in Edinburgh.
Photo by Alan Kirschbaum

The Los Angeles Chapter was well represented at the International Symposium (IS2016) with Past-president Stephen Guine, Vice-president Phyllis Marbach, Marilee Wheaton, and Alan Kirschbaum, plus the author, in attendance.

In keeping with the precedent set at past International Symposia, IS2016 reflected the hard work and initiative of the organizers, many of whom are volunteers. Scottish charm and a solicitous staff were the hallmarks of the symposium.

Edinburgh proved to be an excellent choice for a site; a clean city with "old world" charm and sophistication, a crowning castle, and cooperative weather. With a bit of cheek relative to the length of summer at that latitude, one establishment put out glasses and a pitcher of water, proffering relief from the "week of summer."

Starbucks can be cheaper in Scotland: £1 for a simple cup of coffee.

CSER 2017: It's Coming!
March 23 — 25, 2017

The Conference on Systems Engineering Research (CSER) has become the premier event in the advancement of the science and discipline of systems engineering. The upcoming CSER 2017 is the latest in this series of august annual events – the fifteenth. CSER 2017 is being conducted under the technical leadership of the University of Southern California Viterbi School of Engineering, Systems Architecting and Engineering program.

CSER 2017 offers researchers in academia, industry, and government a common forum to present, discuss, and influence systems engineering research. It provides access to forward-looking research from across the globe, by renowned academicians as well as perspectives from senior industry and government representatives. Co-founded by the University of Southern California (USC) and the Stevens Institute of Technology in 2003, CSER has become the preeminent event for researchers in systems engineering across the globe.

The CSER 2017 **Call for Papers** is out! Papers need to be submitted by **October 2, 1016**. For consideration, visit the website: Viterbi.usc.edu/sae/cser2017.htm for details.

Inside This Edition

The Los Angeles Attendees, left to right: Jorg Largent, Alan Kirschbaum, Past-president Stephen Guine, Marilee Wheaton, Corporate Advisory Board representative from The Aerospace Corporation, Professor and INCOSE Fellow Dr. Barry Boehm, and Vice-president Phyllis Marbach.

Photo by Jennifer Russell

(IS16, continued from page 1)

AWARDS:

Of particular note were the honors and recognition bestowed upon the Chapter and its members.

The Chapter earned a "Platinum Circle" award, "In recognition for performing to the highest goals and standards of our (INCOSE's) organization." "Platinum Circle" is new this year, and is between gold and the singular President's Award for Most Outstanding Chapter. This award recognizes more than the Chapter leadership. It is a recognition of the membership at large and the volunteers who have contributed to the Chapter.

As an aside, and a point not part of this year's formal recognition, the Chapter was complimented on several occasions for the highly successful Regional Mini-conference held in April.

President Terry Rector and *Newsletter* editor Jorg Largent received individual awards in recognition of their contributions to the profession and Eric Belle was acknowledged for his serving as an Assistant Director for the Americas Sector of INCOSE.

KEYNOTE SPEAKERS:

Each day began with a plenary session and a keynote speaker. Each of the keynote speakers came highly recommended and spoke to systems engineering challenges and opportunities before the systems engineering profession and professional, couched in the circumstances of their particular projects and individual experiences.

An added feature this year is the video recordings of the speakers. The recordings are available at:

http://www.incose.org/symp2016/videos

A Must See!

Of special note, in terms of outreach and of Science, Technology, Engineering, and Math was Professor John Holt's ten minute presentation, "Think Engineer," presented Tuesday morning. The video can be see at:

http://www.incose.org/symp2016/videos

Additional IS16 Perspectives

By Marilee Wheaton, Alan Kirschbaum, and Phyllis Marbach

Highlights from Scotland from Phyllis Marbach

The theme for the 2016 International Symposium was **Achieving Excellence through Systems Engineering** and excellence certainly was experienced from the conference center, to the keynotes, the track sessions, and the closing banquet. Congratulations are in order for the planning committee for their attention to detail.

The venue was exceptional with excellent audio-visual support from the Edinburgh International Conference Center (EICC) staff. The EICC staff were very attentive to our needs throughout the symposium. The food was delicious. We even had excellent weather with only a wee bit of rain, which made it hard to stay inside, learning and sharing knowledge.

> INCOSE is the world's authority on systems engineering.
> INCOSE President Alan Harding

One of the main reminders from master of ceremonies Richard Beasley, President of the United Kingdom Chapter of INCOSE, was to learn and share our knowledge. So what did I learn? A few things are included here.

Systems Engineering excellence was demonstrated in the knowledge sharing that happened during the tracks. There were eight and sometimes nine tracks during the technical track sessions with occasional working group meetings as well. Two working group meetings I attended were the Patterns Working Group (WG), and the Agile Systems and Systems Engineering WG (Agile S&SE WG). The Patterns WG is new, and a spinoff from the Model-Based Systems Engineering WG. The Agile S&SE WG started in late 2012. Several papers were presented during the technical tracks from these WGs. The Decision Analysis track included a paper by the co-chairs of the patterns WG, Troy Peterson and Bill Schindel. Their paper was titled "Explicating System Value through First Principles: Re-Uniting Decision Analysis with Systems Engineering." This paper addresses the contextual complexity that can impact systems and decisions. The more systems there are in a system of systems, the more complexity. "First principles" refer to the interactions of forces, energy, mass flow and information. The patterns modeling techniques help manage the complexity using these first principles.

The Agile S&SE WG is conducting workshops with industry and government organizations that are developing systems in an agile way. The first workshop was with the Space and Naval Warfare Systems Command (SPAWAR) System Center (SSC). The findings from this workshop are captured in the paper, "Agile Systems Engineering Process Features Collective Culture, Consciousness, and Conscience at SSC Pacific Unmanned Systems Group".

The Chief Engineer of this project, Chris Scrapper, SSC Pacific Unmanned Systems Group, US Navy, is co-author of the paper.

Reflector Notices:
A Changing of the Guard

Susan Ruth has been a stalwart of the Los Angeles Chapter for many years. She has been responsible for the Chapter's "Reflector Notices," the e-mail notifications telling the members about upcoming speaker meetings, networking events, and other activities of potential interest. She has also served as coordinator and hostess for many of the events held at The Aerospace Corporation.

Susan sent the following message to the board of directors:

"It has been my honor to serve as both the reflector manager and the person who sends emails to our members and friends for quite some time. I've learned a lot, but it's time to pass the baton. You will be in good hands with Deborah Cannon, also from Aerospace, who has volunteered to succeed me. Please provide her with the same valuable feedback that you have provided to me over the years.

In addition, there is a team at Aerospace that will be sharing hosting duties, they are Philip Cojanis, David Jablonski and Katrina Lyons, as well as Deborah. This is a diligent and capable team and I'll be in the background to help out as needed and make the transitions as smooth as possible."

The Board of Directors and the entire Chapter appreciate the contributions made by Susan, and profoundly thank her.

The Board welcomes Deborah as she assumes this challenging role, and asks the members to support her as she assumes this responsibility. Deborah can be contacted at:

deborah.a.cannon@aero.org

Starbucks can be cheaper in Scotland: £1 for a simple cup of coffee.

Barkley Brown of IBM and Past-president Stephen Guine discussing the symposium.

August Speaker Meeting
Highlights from the 2016 INCOSE International Symposium

Each year, INCOSE hosts a four-day International Symposium as its flagship event for systems engineers worldwide. This year's conference was held in Edinburgh, Scotland on July 18-21. Five attendees, Phyllis Marbach, Alan Kirschbaum, Jorg Largent, Stephen Guine, and Marilee Wheaton, will share their experiences, and summarize current themes and advances from the conference presentations and committee meetings.

PARTICULARS:

DATE and TIME: Tuesday, August 16, 2016, 5:30 p.m. to 8:00 p.m.

AGENDA:

5:30 – 6:20 p.m.: registration, networking, refreshments

6:20 – 6:30 p.m.: welcome and announcements

6:30 – 8:00 p.m.: formal meeting followed by questions and answers.

Host site: The Aerospace Corporation, Building D8, Room 1010, 200 N. Aviation Blvd., El Segundo, California 90245.

Refreshments will be provided at this site.

NOTE: REGISTRATION IS REQUIRED TO ATTEND AT THE HOST SITE (The Aerospace Corporation) and at the Jet Propulsion Laboratory (JPL) REMOTE SITE.

Host site and JPL registration is required before Tuesday noon on August 9, 2016.

You will be asked to provide your email address, name, title, company, phone number, and membership and citizenship information, and to identify at which site you will be attending (host site, remote site or virtual/standalone).

The website address is:
http://tinyurl.com/incosela0816

We apologize for the inconvenience; we observe the security procedures of our host sites. For remote venues and virtual attendance please RSVP by Monday noon, August 15, 2016. Virtual Attendance instructions will be emailed on Tuesday morning, August 16, 2016.

If you are uncertain whether or not you'll be able to attend, DO make a reservation and indicate that you're "probable". This helps with the planning.

Remote Sites (potential): AV College in Lancaster; Boeing in Huntington Beach, Capstone Turbine in Chatsworth, JPL in La Canada, Control Point Corp in Goleta, Northrop Grumman Corporation (employees only) in Azusa.

Webcast virtual site (Global Meet): Register as an individual virtual participant. (You must RSVP by Monday noon August 16, 2016.)

Big-Data Technology Innovation:
Hadoop, Real-time, and Machine Learning
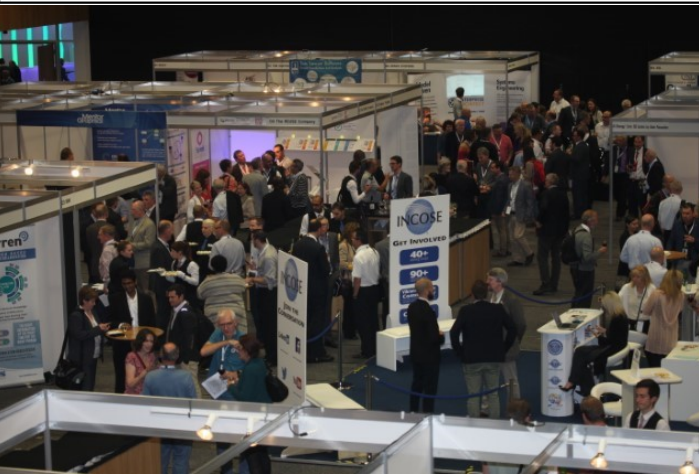### The July Speaker Meeting
By Rick Hefner

The speaker for our July meeting was Dr. Andy Feng, Vice President of Architecture at Yahoo. Over 60 attended the meeting in person on the Caltech campus, with about 20 additional attendees at various remote sites.

Yahoo started developing big-data technology with Hadoop MapReduce and File System in 2006, and made it an Apache open source project in 2009. In the past three years, Yahoo has been a leading contributor to Apache Storm for event processing, Apache HBase for distributed NoSQL stores, Apache Spark for faster processing, and Druid for sub-second analytics. These technologies perform real-time processing and advanced machine learning against 600 petabytes of data.

Dr. Fang started by describing the Yahoo use cases (search, advertising, and personalization) where big-data technologies are used to extract understanding from large sets of data. Applications include Flickr (photo recognition), spam detection, account security, and content recommendation. One of the more interesting applications involve the Yahoo search engine, both in attempting to recognize the context of what someone is searching for and determining how to best rank pages to respond to specific searches. The numbers are staggering; Flickr handles over 10 billion photos and is growing at 8 million per day.

Dr. Fang also described the system architecture of their heterogeneous clusters of 40,000 servers for supporting a variety of workloads. Efficient resource allocation is a major drive of cost and processing speed. He also summarized current directions in machine learning. The more data we can process, the better the models we can construct. He closed by summarizing future directions for Yahoo, identifying how academic researchers and industry technologists are helping to advance big-data technologies.

Fifth Annual Mars Rover and Los Angles and Orange County Society Expo!

This is also a Los Angeles and Orange County area-wide Science, Technology, Engineering & Math outreach, so junior high school, high school and college students are most welcome.

The robotic exploration vehicle on the planet Mars, "Curiosity," is the latest and largest Martian rover — a "Mini-Cooper" on Six Wheels! Curiosity is carrying a wide variety of advanced scientific experiments and is sending back pictures and data as it prowls the expanses of Mars!

GUEST SPEAKER: The guest speaker is NASA-JPL's Charles Baker, a Curiosity Mission Engineer. Mr. Baker will be sharing:

- Amazing Curiosity engineering and scientific results to date
- Curiosity Landing Site Scale Model, Hardware & Mock-ups
- Exhibit Tables from Several Los Angeles and Orange County Professional Societies, including the Planetary Society, IEEE, INCOSE, AIAA, SWE, IET, AFCEA, OCVitalLink, FSEA, IET, SAE, OSSC and SWE, among others
- Closing questions and answers and a free raffle for "space-related" prizes

WHEN: Saturday, September 10, 2016
TIME: 1p.m. to 5p.m.
WHERE: the Northrop Grumman S-Café in Redondo Beach
(South of Marine Ave at the end of Simon Ramo Drive)
COST: FREE (Parking & Admission)!
FREE bottled water and healthy snacks will be available.
RSVP to: http://mars5.eventbrite.com
Questions: contact Fred Lawler, 714-369-9516, fredlawler@hotmail.com

The exhibitors' gallery, below, was a popular gathering place during the International Symposium

A MARTIAN SELFIE

Americas Sector Update

By Phyllis Marbach

INCOSE chapters are categorized in three sectors:
1. The Americas
2. Europe, Middle East and Africa (EMEA), and
3. Asia-Oceana.

In January 2016 Dr. Stephen Dam succeeded Dr. Barclay Brown as the Director of the Americas Sector. Dr. Dam brings years of service to his role. In his professional roles, Dr. Dam is the President and Founder of the Systems and Proposal Engineering Company, based in Marshall, Virginia. He has been involved with structured analysis, software development, and system engineering for over 40 years. He participated in the development of various architectural frameworks and is currently applying system engineering techniques to various Department of Defense and Department of Energy projects.

As the Director, Americas Sector, Dr. Dam conducts meetings with chapter officers from within the Americas Sector. He conducts these meetings approximately quarterly, doing so either electronically or in person, such as during International Workshops or International Symposia. The most recent such meeting was held during IS2016 on July 16, 20116. Those in attendance were:

- Steven Dam, Director, Americas Sector
- Jaci Pratt, Australia
- Alan Harding, INCOSE President, United Kingdom
- Gary Roedler, INCOSE President Elect, United States
- Dorothy McKinney, San Francisco Bay Area Chapter
- Gina Guillaume-Joseph, Washington Metro Area Chapter, (WMA)
- Paul Fomin, WMA
- Dave Long, WMA
- Amy Wang, INCOSE central office
- Eileen Arnold, North Star Chapter (Minnesota)
- Ellie Gianni, Chesapeake Chapter (Maryland)
- Bill Good, Front Range (Colorado)
- Everett Lewis, Cross Roads of America Chapter (Indiana)
- Rachel LeBlanc (INCOSE Director for Marketing and Communications)
- Phyllis Marbach, Los Angeles Chapter.

The meeting started with Jaci describing plans for the next symposium, IS2017, which is planned to be held in Adelaide, Australia. The dates for IS2017 are July 15-20, 2017, inclusive. The theme is: "Unlocking Innovation through Systems Engineering," and the submission deadline for papers is November 7, 2016. Jaci mentioned that this will be Australia's winter so the weather will be cool and may include rain. She suggested that global businesses could include a trip to meet with international partners as part of their conference travel plans to help obtain approval to attend IS 2017. Australia is a large country so attendees should plan their travel and sightseeing accordingly. Jaci will provide INCOSE chapter leaders charts describing IS 2017 to let their chapter members know more about next year's International Symposium.

Third Quarter Strategic Planning Meeting

Strategic Planning Meetings are an opportunity for the members of the Chapter to meet with the Board of Directors and to comment of Chapter activities. It is also an opportunity for members who are looking for an opportunity to contribute to the profession in the Los Angeles area to learn about those opportunities.

Strategic Planning Meetings are also an opportunity for the Board of Directors to report on the Chapter's progress toward meeting the goals for the year.

The Chapter's third Strategic Planning Meeting is to be held Saturday, August 20, 2016 on the Caltech campus in Pasadena. The meeting will be held in Room 105 of the Annenberg Center. The meeting starts at 9:00 a.m. and will continue into the early afternoon, but not later than 3:00 p.m. Light refreshments and lunch will be provided. Please register on-line so that we can plan the accommodations.

Directions to Caltech:

Caltech is at the intersection of South Hill Avenue and East California Boulevard. People approaching on the 210 Freeway should exit at North Hill Avenue and proceed south. The campus will be on the left. People approaching from the south on the Pasadena Freeway should continue north on South Arroyo Parkway to California Boulevard. Turn right onto California Boulevard and the campus will be on the left. A map is located at http://www.caltech.edu/map/. Visitors may park in any unreserved spot in Lot 9, Lot 10, or the Holliston parking structure. The Annenberg Center is south and east of Lot 10. It is due west of the Hollister Parking structure.

Volunteer!
You will learn something you never knew you needed to know

**Haute cuisine and excellent service
at the International Symposium**

Those in the room introduced themselves, mentioned any issues their chapters are having, or activities in which their chapters are engaged.

Ellie Gianni mentioned that the Chesapeake Chapter is having its gala for systems engineering professionals (SEP) on August 24, 2016. They plan to recognize their Associate Systems Engineering Professional (ASEP), Certified Systems Engineering Professional, and Expert Systems Engineering Professional with patches this year. They also conducted training for the ASEP rating and most who attended planned to take the ASEP exam. The company which conducted the training offered that those who failed could attend the training again the next time for no charge. They also attend job fairs in their area and encourage their members who are looking to attend as well. Those who hold the job fairs let INCOSE have a booth for no charge.

Bill Goode of the Front Range Chapter mentioned that he co-authored a paper with Scott Workinger and Iona Mann on the Global Water Nexus. Their paper will be presented at an International Society for the Systems Sciences (ISSS) conference next week being held in Boulder, Colorado.

Phyllis discussed the LA Chapter's plan to develop a "Jeopardy" game to help students study for their SEP tests and that the LA Chapter plans to share it with INCOSE when it is completed. Phyllis also reported that the first Southwestern INCOSE Regional conference was held in April and was a big success. The Los Angeles Chapter is actively recruiting more CAB members. Steve asked if we had trouble with sponsorship and expressed concern that our regional conference was at approximately the same time as the SEDC regional conference. Phyllis answered that it did not appear to affect the sponsorship. The RMC committee had very effective sponsorship recruiters.

Bill asked if officers can get business cards and we were referred to the Communication Policy for how to use the logo on business cards. Chapters can get business cards made for their board members. One person asked about getting a template for an Memorandum of Understanding between another organization or industry and we were advised to ask Ian Gibson, Outreach Ambassador, for that template.

During this discussion about teaming with other chapters, Phyllis mentioned that the LA Chapter is looking to collaborate with IEEE on the GameSIG to help implement systems engineering best practices in the game development and we will first put an MOU in place. Dorothy mentioned that the San Fran Bay Area Chapter August speaker is Mark Gerhardt, Chief Architect of nHansa, Inc., who will present "Modeling Made More Meaningful."

Steve mentioned that the next report from the Americas chapters is due before the next sector meeting which is in October.

Actions:

Get a copy of the IS 2017 charts from Jaci

Review the INCOSE Communications Policy for guidelines on business cards.

Talk with Ian Gibson about an MOU template.

Submit a summary report of LA chapter info to Steve Dam by end of September.

Advertise the SFBAC August meeting to LA Chapter members.

June Speaker Meeting

Kathleen Terry discussed "Networking: A Strategy for Every Stage of Career Development" at the INCOSE-LA speaker meeting on Tuesday June 14, 2016. During the introduction of the speaker, Rick Hefner, the LA chapter Program Director, admitted that he got the idea to invite a speaker to talk about networking from our recent Strategic Planning Meeting in May. Our next Strategic Planning meeting will be August 20, 2016 at Caltech, please add to your calendar, plan to attend and help us plan future topics. Rick shared that Kathleen teaches others how to get along and deal with conflict.

Ms. Terry asked those present how we felt about coming early for the networking period from 5:30 to 6:15 p.m.. Not everyone is comfortable coming early to an event and talking with others they don't know. Kathleen emphasized not only how important it is to develop your relationships in social events but also gave guidance about managing your electronic social network. Eighty percent of jobs are filled through networking and internal referrals. Engineers in particular tend to focus on their work sometimes rather than take the time to develop their relationships with people and to follow-up with individuals they meet at professional events. Remember, "people do business with those they like and trust."

Kathleen's Networking 101 chart included that you need to have the right mindset, you need to be yourself and be authentic and you need to have the tools to network with you at all times, such as business cards. When you are out networking be ready. Also, it helps to act like a host not like a guest. Make the interaction about the other person. Ask yourself, "What can I do for this person?". Perhaps you can introduce the person you are talking with to others in the room, for example. When you enter a room where others are gathered make a point to meet new people. Listen and ask questions of those new people and provide leads or referrals whenever possible. Write notes on the backs of business cards you collect to help you remember the person better and what you might have suggested to them and then follow-up.

Karen Miller, Paul Cudney, Colette Kurtz, Malcome Currie, Phyllis Marbach, Kathleen Terry, Rick Hefner, a guest, and Shirley Tseng at the June Speaker Meeting

The theme for CSER 2017 is, "**Disciplinary Convergence: Implications for Systems Engineering Research,**" and serves as a spring board for papers and discussions across the spectrum of challenges facing the discipline in both the world of academia and the world of the practitioner.

With this theme as a backdrop, papers are being accepted on the following topics:

- Formal Methods in Systems Engineering
- Resilience and Affordability
- Model-Based Systems Engineering
- Systems and SoS Integration
- System Architecture and Complexity
- Trade-space Visualization and Analysis
- Cognitive Systems Engineering
- Cyber secure resilient systems
- Lean and Agile Systems Engineering
- Cyber-Physical Systems and Internet of Things
- Systems Thinking and Complexity Management
- Infusion of System Science into Systems Engineering
- Uncertainty Quantification
- Smart Manufacturing
- Advancing Systems Engineering Education
- Systems Engineering and Decision Science

Interested in participating in this world class event?
Get in touch with terry.rector@aero.org.
Please have in mind what you would like to do.
All positions are open at this early stage.

In addition to this wide selection of topics looking to the future of systems engineering, CSER 2017 features a full slate of luminaries from academia, government, and industry as keynote speakers and panelist.

CSER 2017 is looking forward to a stellar cadre of keynote speakers.

Dr. Yannis C. Yortsos has served as Dean of the USC Viterbi School of Engineering since June 2005. He is the Chester F. Dolley Professor of Chemical and Petroleum Engineering, and holds the Zohrab A. Kaprielian Dean's Chair in Engineering. Dr. Yortsos is well known for his work on fluid flow, transport and reaction processes in porous and fractured media with applications to the recovery of subsurface fluids and soil remediation. He has been actively involved in the peer review of the Yucca Mountain Project for the disposal of high-level radioactive waste.

Dr. Greg Hyslop is the chief technology officer of The Boeing Company and senior vice-president of Boeing Engineering, Test & Technology. Dr. Hyslop oversees the development and implementation of the enterprise technology investment strategy, and his portfolio of responsibilities includes the companywide Boeing Engineering function; Boeing Research & Technology, the company's advanced central research and development organization; and Boeing Test & Evaluation, the team that verifies and validates Boeing's commercial and defense products.

Ms. Kristen J. Baldwin is the Principal Deputy to the Deputy Assistant Secretary of Defense for Systems Engineering (DASD(SE)). Ms. Baldwin acts on behalf of the DASD and is responsible for engineering and technical workforce, policy, and systems engineering planning for major defense acquisition programs. Her oversight includes concept engineering and analysis, design, development and manufacturing, and independent program review and assessment. She supports the DASD role of functional leader for more than 40,000 defense acquisition professionals in the Department of Defense (DoD) Engineering and Production, Quality, and Manufacturing workforce. She oversees the DoD strategy for Trusted Systems Design.

Dr. Paul D. Nielsen is Director and Chief Executive Officer of the SEI, a global leader in advancing software and cybersecurity to solve the nation's toughest problems through focused research, development, and transition to the broad software engineering community. The SEI is a key innovator in areas central to the U.S. Department of Defense and civilian government operation in the cyberspace domain, including software architecture, software product lines, interoperability, the integration of software-intensive systems, network and system resilience, and the increasing overlap of software and systems engineering. The SEI also provides direct support to more than 50 U.S. government entities in their efforts to efficiently and effectively acquire and sustain new software and systems.

Integrated with the USC team of faculty, staff, and students is the Los Angeles Chapter of INCOSE. Continuing a long-standing role of facilitation with USC and fresh off the highly successful Regional Mini-Conference, INCOSE-LA is working on coordinating the venue, support logistics, sponsors, and exhibitors.

The venue has been established: The Crowne Plaza Hotel. The Crowne Plaza Redondo Beach and Marina was the venue for CSER in 2014, and the source selection process resulted in the decision that the Crowne Plaza was the best choice for CSER 2017. The team is working on the details of meeting rooms, space for sponsors and exhibitors, dining, and lodging for the attendees.

The team has started contacting potential sponsors and exhibitors, and our overtures are being well received. Attendees can expect another superb selection of industry and academic leaders as sponsors and exhibitors.

For sponsorship and exhibitor information contact Dick Emerson at remerson9@gmail.com

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Freedom of speech is the right to yell "theater" in a crowded fire.
Abby Hoffman

INCOSE-LA Needs You!

By Lin Yi, Communications Director

The Communications committee is looking for volunteers in both short-term projects and long-term positions:

- Website team member (1)
- Social media evaluation team member (2)
- *Newsletter* production team member (1)

Please contact communications@incose-la.org.

15th *Annual* Conference on Systems Engineering Research (CSER)

March 23 - 25, 2017, Crowne Plaza Hotel, Redondo Beach, CA

Disciplinary Convergence: Implications for Systems Engineering Research

Conference General Co-Chairs, USC

Prof. Azad M. Madni
Systems Architecting and Engineering

Prof. Barry Boehm
Systems and Software Engineering

Technical Program Co-Chairs, USC

Prof. Roger Ghanem
Mechanical Engineering

Prof. Daniel Erwin
Astronautical Engineering

Research Paper Topics

- Formal Methods in Systems Engineering
- Resilience and Affordability
- Model Based Systems Engineering
- Systems and SoS Integration
- System Architecture and Complexity
- Trade-space Visualization and Analysis
- Cognitive Systems Engineering
- Cyber Secure Resilient Systems
- Lean and Agile Systems Engineering
- Cyber-Physical Systems and Internet of Things
- Systems Thinking and Complexity Management
- Infusion of System Science in SE
- Uncertainty Quantification
- Smart Manufacturing
- Advancing Systems Engineering Education
- Systems Engineering and Decision Science
- Wireless Health

Application Areas

- Autonomous Vehicle Networks
- Defense Systems and System-of-Systems
- Space and Aerospace Systems
- Financial Systems
- Global Supply Chains
- Healthcare Delivery
- Homeland Security
- Smart Manufacturing
- Medical Devices
- Sustainable Energy
- Transportation Systems
- Urban Systems and Infrastructure

Venue

- Crowne Plaza Hotel
  300 N Harbor Dr, Redondo Beach, CA 90277

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Important Deadlines

- *October 2, 2016:* Full papers due
- *December 15, 2016:* Notification to authors
- *February 1, 2017:* Final Conference Papers due
- Paper Length: Maximum 10 pages
- To Submit a paper and download the paper template visit: viterbi.usc.edu/sae/cser2017.htm

Conference Website
www.CSER2017.com

Conference Co-Managers

Mr. Terry Rector
The Aerospace Corp.

Ms. Marilee Wheaton
The Aerospace Corp.

USCViterbi
School of Engineering
Systems Architecting and Engineering

INCOSE
LOS ANGELES

STEVENS
INSTITUTE *of* TECHNOLOGY
THE INNOVATION UNIVERSITY

For Sponsorship/Exhibitor information contact Richard Emerson, remerson9@gmail.com

September Networking Event

WHAT: INCOSE-LA Professional Networking Event
This event will be held in Westminster
WHEN: Wednesday, September 21, 2016, 5:30 p.m. to 8:00 p.m.
WHERE: Michael's Sports Pub & Grill
15192 Goldenwest Street, Westminster, CA 92683
Phone: (714) 373-5665
http://michaelssportspubandgrill.com
EVENT CONTACT: Scott Birtalan, 424-217-0743, scottbirtalan@gmail.com
COST: INCOSE-LA will provide appetizers and non-alcoholic beverages. There is a charge for alcoholic beverages. Happy hour is 4:00 p.m. -7:00 p.m.
RSVP: Deadline is Monday noon, September 19, 2016. Please register to attend this event. Attendance is limited. We request that all reservations be made online.
PURPOSE: Join the INCOSE-Los Angeles Chapter for an evening of networking with other chapter members, including representatives from the INCOSE-LA board. The Chapter will host appetizers and non-alcoholic beverages. Enjoy the company of other Systems Engineering professionals. Chapter members are welcome and encouraged to attend! We especially encourage new chapter members to attend.

Sacred cows make the best hamburgers.
Abby Hoffman

(June Speaker Meeting, continued from page 6)

Electronic social networks include Facebook, LinkedIn, Twitter, and many others. Kathleen provided tips regarding establishing social networks and how important it is to make those connections count. Continue to reach out periodically. "Ensure the door stays open, even if no one is walking through it right now." Sometimes it takes time before that network bears fruit and it is important to be patient. "Focus not only on what you can gain but also what you can give." Spend time on your network regularly, build the network as you go, find organizations you are interested in, identify thought leaders and share content of your own. Systems Engineers in particular are frequently the connectors to multiple other engineering disciplines not only in aerospace, but in transportation and health care systems. Applying networking techniques throughout a systems engineering career will serve you well.

Read about on-going systems engineering discussions at the INCOSE LinkedIn webpage: https://www.linkedin.com/groups/7499834

Errata
By Denise Howard

The June edition of the *Newsletter* included a column filler with a quote attributed to Dr. Mark Maier. Denise sent in the following:

I noticed the boxed quote on page 10 you attributed to Mark Maier and thought it might be helpful to point out that it actually originates with artificial intelligence expert, Herber A. Simon. Eberhardt Rechtin lists something similar as one of his heuristics in his Systems Architecting without attribution and it was probably unwittingly carried into Maier's work as well. For many years, I thought it belonged to Rechtin, but it doesn't. Eventually, I hope the USC contingent will correct this.

We can help future scholars understand the proper linage of this interesting observation.

Herbert A. Simon. 1996. The Sciences of the Artificial, 3rd Edition. MIT Press

"Systems will evolve from simple systems much more rapidly if there are stable intermediate forms than if there are not." (Page 196, in Chapter 8, The architecture of complexity: hierarchic systems)

The CSER 2017 Call for Papers is out!
Papers need to be submitted by **October 2, 1016**.
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Notification (acceptance or rejection, plus any needed refinements) to authors: December 15, 2016
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Risk Management for the RMC16
By Julie Foster

Attending a good conference offers the chance of being immersed in a crowd of people who have the same passion as you, of finding a unique perspective on something you've taken for granted, and meeting old friends, and making new ones. You leave a good conference full of excitement and ready to return to work full of fresh ideas.

Planning and running a conference, on the other hand, is incredibly hard work. Every plan needs to be double checked because Murphy's Law is in full effect when you're running an event. No matter how much you prepare, something will go wrong at some point.

Risk Management was used in planning the RMC16 with great success. The biggest risks were minimized by planning as much as possible, as early as possible. We used the four steps taken from the INCOSE Handbook: "identify, analyze, treat and monitor the risks continually."

Identify
There are several ways to identify risks:

1) Have the right people involved who are familiar with the tasks and associated risks

2) Use prior experience and documentation such as charters, budgets, schedules, etc.

3) Identify the essential functions or goals and identify all the possible ways these functions might fail.

The RMC16 risks used these broad categories to monitor:

- Registration and attendance
- Speakers and presentations
- Venue and catering
- Volunteers
- Operational issues

Analyze
The second step is to analyze the risks by deciding the probability of each one happening, and to analyze the impact to the conference would be if it occurred. The initial evaluations are important for the planning process, but the evaluations are ever changing. The process needs to be repeated to be ready for major decisions, whenever conditions change, and periodically throughout the entire process. The overall estimation of these risks is a major indicator of the conference success or failure and an early warning system for avoiding disaster.

The combination of the probability and impact can be charted on a 5x5 matrix. By using the color scales in combination with detailed descriptions of each risk, it is easy to see at a glance where the teams' efforts should be focused to reduce the risks.

For example, some of the RMC16 risks we identified are listed in Table 1, below. Each of these risks were then added to the 5x5 matrix (Table 2):

Table 2					
Probability/ Impact	Negligible	Low	Moderate	High	Catastrophe
Near Certain					
High					
Moderate			3		2
Low			4	1	
Insignificant					

Treat
The third step in the risk management process is to come up with strategies to mitigate each risk that was identified. To illustrate how these strategies work, let's say a risk that you have identified for yourself is that by arriving late to work by 30 minutes every day this week, your boss is ready to call you into his office on Friday. Here are some strategies you could employ:

- Avoid – You could ask to telecommute and avoid "arriving" late.
- Control – You could set up Google Maps to monitor the traffic and give you time to get out of the door on time.
- Transfer – You could become part of a carpool and therefore you transfer the risk to the entire carpool.
- Assume/Accept – You could continue your habits and just be ready for the coming lecture.

Here is an example of some of the strategies that we employed for the RMC16 for the registration and attendance risks that were identified:

- Get some professional support in producing advertising brochures and work with Chapters to ensure advertising information is sent to all members.
- Develop plan for backup speakers, videos, or possibly shorten the event if there are not enough speakers available.
- Do a promotional push before deadlines (abstract due date, Call for Papers, early registration, registration deadline).

Monitor
The fourth step is to monitor the risks. During the planning and execution phases of the conference, your task is to monitor the potential risks and respond accordingly.

Table 1 RMC Risks				
	Title	Narrative	Probability	Impact
1	Change of Venue	If LMU doesn't open the new facility in time, then the conference will need to relocate to a facility that will cost more.	Low	High
2	Call for Papers (CFP)	If the CFP is not published soon, potential attendees may develop conflicts with the conference's schedule	Med	High
3	Response for abstracts	If there are not enough responses to the CFPs then the conference attendance could drop. Expecting 50-60 abstracts to fill 45 slots.	Med	Med
4	Volunteers - Staffing	If volunteers fail to follow through on staffing the event, conference and safety of attendees could be affected.	Low	Med

On Monday INCOSE President Alan Harding formally opened the proceedings with a discussion of INCOSE's vision and mission, a global INCOSE, and working globally.

> Total dependency on smart stuff is not very smart.
> Professor Larry Leifer

President Harding's presentation was followed by the opening keynote speaker, Professor Larry Leifer of Stanford University. Dr. Leifer is a Professor of Mechanical Engineering Design and the founding director of the Center for Design Research and Hasso Plattner Design Thinking Research Program at Stanford University. Professor Leifer's talk, "Design Thinking Theory from Practice, Dancing with Ambiguity," with a sub-title, "Embracing the Tension Between Divergent and Convergent Thinking in Systems Engineering," had several keen insights into the practice of engineering in general and systems engineering in particular. One of the challenges he presented to the audience was to study how systems engineers do what they do.

> Engineering is an art, and
> its implementation demands elegance.
> Professor Jon Arnold, Stanford University

The keynote speaker for Tuesday was Craig Lucas. Mr. Lucas is the Acting Director of Science and Innovation for the Department of Energy and Climate Change (DECC). The role includes leadership of the department's energy innovation program, management of the central team of engineers and scientists providing support to all DECC programs, development of the policy framework for energy sector innovation, and oversight of the department's science and innovation budgets and contracts. He also represents DECC on the board of the Energy Technologies Institute.

Mr. Lucas discussed several of the needs with respect to energy systems and the corresponding challenges to the systems engineering profession. He noted a need for new approaches to modeling, some with respect to new technologies. Current models are not very good at predicting which of the many new technologies, which are all in a state of gray maturity, is actually going to get to maturity fast enough. There is a need to learn a great deal more about the cyber world. And there is a need to rethink the human element of the energy systems. It is not a very attractive offer to a customer to say, if you have a bit of a financial saving you have to use your energy at a different time that is a bit less convenient. It is not a really good sales pitch to a customer. Mr. Lucas asked, "how do we take them on the low carbon journey without just offering them permanent penury?"

Mr. Lucas illustrated another challenge facing the systems engineer of a large system of systems. According to Mr. Lucas, John Moffat is chair of the Energy Research Partnership and about eighteen months ago they held a dinner of transport chief executives and energy chief executives to talk about the interaction between transportation and energy. Commented Mr. Lucas:

"As the dinner progressed it became clear that this group had never had a conversation, and what also became clear it wasn't just that their analytic models were different, their mental model of the world was completely different. Commented Mr. Lucas, **"that's where, as systems engineers, we have real job of work to do."**

Mr. Lucas' presentation would be of special interest to systems engineers working on, or interested in, the challenges facing energy systems, energy consumption, and environmental protection in California.

NETWORKING:

One of the major benefits of attending the International Symposia is networking. Lunches and breaks provided an opportunity to meet with other systems engineering professionals, and to exchange views and observations with respect to the panel discussions and with respect to the papers presented. It also gave those in attendance an opportunity to meet with the sponsors and exhibitors and to learn about a range of tools available to the systems engineer and about educational opportunities.

In all, this International Symposium was well attended, and well executed; a benefit to those in attendance and a compliment to the organizers and the hosts.

> The opposite of complexity is clarity, not simplicity.
> Peter Tuddenham

See below for directions to The Aerospace Corporation.

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:
Take the exit towards El Segundo Blvd.
Turn Left onto S La Cienega Blvd.
Take the 1st Right onto W El Segundo Blvd.
Take the 2nd Right onto N Aviation Blvd.
Bldg. D8 will be the third building on the right, just past the discount bakery.
From the San Diego (405) Freeway traveling NORTH:
Take the El Segundo Blvd exit, Exit 44.
Turn Left onto W El Segundo Blvd.
Turn Right (North) on N Aviation Blvd.
Bldg. D8 will be the third building on the right, just past the discount bakery.
From the 105 Freeway traveling WEST:
Take the exit towards 405 South
Before getting onto the 405 Freeway, take the El Segundo Blvd exit
At the bottom of the ramp, turn left (west).
Turn right on Aviation Blvd.
Bldg. D8 will be the third building on the right, just past the discount bakery.

The patterns techniques were used in capturing the process used by this project. Rick Dove, the Agile S&SE WG lead, referred to the SPAWAR process as "The Wave" which is described in more detail by Chris and Judith Daumann in a paper titled roughly, Classic Wave Process, INCOSE IS2016. Three other projects have been interviewed by the Agile S&SE WG from companies: Lockheed Martin, Northrop Grumman and Rockwell Collins. At least two of these reports will be written and submitted to the IS 2017 to be held in Adelaide Australia July 15-20, 2017. Mark your calendars and join us Down Under.

Someone once told me that participation in the working groups was a good way to help with moving systems engineering forward and I agree with that recommendation. There are many working groups addressing the challenges of developing complex systems in this continuously changing world of ours. My goal in the next two years is to capture the Agile guidance and content developed so far into the Systems Engineering Body of Knowledge (SEBoK). Rick Adcock (SEBoK lead) has invited me to become a member of the SEBoK editors team. My next highest priority item to work is defining a Guidance Document between the Agile S&SE WG and the SEBoK.

This is just a fraction of what I learned at the IS2016. We hope you will attend the Speaker meeting in August to learn more about what happened during the symposium to be presented by members of INCOSE-LA who attended.

Highlights from Scotland from Alan Kirschbaum

It's been a number of years since last attending an INCOSE symposium, and I must say that I'm duly impressed with both the advances in the art and science of systems engineering and the extent to which systems engineering practice has taken hold outside of its founding domains. The United Kingdom chapter staged a throughly intellectually stimulating and professionally well executed meeting—a benchmark for future conferences.

This was also my first fully wi-fi and smartphone app-enabled conference (far more integrated than the last AIAA Space meeting), and personal productivity benefited greatly from the technology.

Vice-president Phyllis Marbach accepting an award for President Terry Rector from INCOSE President Alan Harding

Two keynote speeches, in particular, captured the directions and energy of a more complete understanding of the scope of systems engineering. The first brought together the ideas of systems design and systems engineering as promoted by Prof Larry Leifer at Stanford. On my first exposure to the fad of systems design, I thought, "what's new?" Haven't we been doing this for 50 years? No! Dr. Leifer and his colleagues have taken systems thinking down a level to the product design space, and now, in collaboration with the SE community, up a level to deal with complicated, large scale, critical systems.

The second memorable keynote came from lapsed-engineer, educator, and "talent executive" Dr. Emma Langman, who gave a talk titled "Who are Yous." She employed systems thinking to focus on personal growth and transformation as illustrated in her own journey from an accomplished student (which has its downsides) to a globally-focused leader and guide. Her talk compellingly promoted the insights found in the works of Oshry, Dweck, Rooke and Torbet as useful guideposts in learning to know one's many selves.

In between these two keynotes, the week overflowed with carefully selected papers and panels. I found it encouraging that new research in domains new to SE (such as undersea exploration) draws inspiration from earlier insights published by INCOSE luminaries such as our Los Angeles colleagues Rechtin, Boehm, Jackson, Troncale, and Martin.

Of course, the glue that held it all together and generated innovative thinking was the stimulating social time spent with others. With over 800 attendees from 27 different countries, and over a dozen industries represented, one was sure to find a broad range of fresh perspectives and ideas to draw upon. Particularly striking were the number of young and new members present— a testament to the progress in incorporating SE curricula in higher education, worldwide.

Highlights from Scotland from Marilee Wheaton

Arriving in Edinburgh on Saturday morning from my connecting flight in Newark, I dropped my luggage at the Fountain Court Harris Apartments and headed over to the Corporate Advisory Board (CAB) meeting.

Some of the highlighted topics covered at the CAB meeting included:

- Karen Weiland from NASA provided a presentation on Training and Education in Systems Engineering Competencies.
- Chi Lin from JPL spoke on Integrating MBSE Practices into systems engineering education programs.
- Barclay Brown from IBM spoke on a possible project on Systems Engineering for the Internet of Things.
- Rick Dove from Paradigm Shift provided a report on Agile Systems Engineering Life Cycle Project First Year.

The CAB dinner was held at a very grand restaurant in Edinburgh called The Grill Room at The Dome. The elegant building has been there for some two hundred and thirty years, first as the Physician's Hall and then the national headquarters of the Commercial Bank of Scotland. The restaurant opened in 1996.

There is a new grass roots initiative called Empowering Women as Leaders in Systems Engineering (EWLSE). I was invited to participate on a panel for a workshop entitled "Beyond the Resume: Personal Journey of INCOSE Women Leaders."

As the risks are re-evaluated, the changes can be captured by adding a directional arrow to each risk that has changed in value.

In Table 3, risk 1 looks like it is getting more serious, while 2 and 3 are getting less concerning. Ideally all the risks would be moved into the green area by some action, but realistically this is not always possible.

Table 3					
Probability/ Impact	Negligible	Low	Moderate	High	Catastrophe
Near Certain					
High					
Moderate		3 ←		1 ↑	
Low			4		2 ↓
Insignificant					

During the RMC16 planning sessions, monitoring involved the whole team. This was done by everyone participating in weekly conference status meetings, adding and updating the risks and strategies, and keeping track of the risks still in the red and yellow zones.

Lessons Learned

Some of the lessons we learned in putting risk management into practice for the RMC16 were:

Risk identification activity should be applied early and continuously throughout the life cycle of the project.

We should have included in the identification phase:

Promised sponsorship

Promised vendors

Promised exhibitors

Registration: there is an initial, but usually small, surge. Near the end of the early, discounted fee period there was the largest surge and at the end of the on-line registration was the final surge.

Should consider a push in promotion at each of the deadlines to maximize attendance.

Risk documentation for RMC16 can be re-used for future events.

We spent several months of the year for just two days, but the conference was a great success. An effective event risk management process can yield great benefits for conference planning, such as: reduced uncertainties associated with conferences, better preparation for possible adverse events, decreased cost of risk (e.g., financial, health and safety, insurance), meeting of all contractual, legal, and insurance requirements, and protection of the brand from significant risk exposures and reputational damage.

This four step process of risk management can be duplicated for INCOSE's future conferences. The INCOSE-LA Chapter is continuing to put risk management into practice as we begin the planning for the 15th Annual Conference on System Engineering Research (CSER 2017), coming up on Mar 23 - Mar 25, 2017.

INCOSE Fellow and member of the Los Angeles Chapter Marilee Wheaton taking lunch between meetings and paper presentations.

The panel of women provided brief vignettes on how they got into systems engineering and advice for workshop attendees. I incorporated comments on heuristics for leadership and decision making authored by INCOSE Pioneer Dr. Eberhardt Rechtin. I also shared a new book authored by CEO and systems engineer at The Aerospace Corporation, Dr. Wanda Austin entitled "Making Space: Strategic Leadership for a Complex World".

Since the symposium was held in Edinburgh, they had to have some afternoon "fringe sessions" for which the city is well known. I attended the Monday afternoon fringe session by magician and systems engineer, Jon Holt. Holt is also the book author of a delightful new STEM children's book called "Think Engineer" with a "Cat in the Hat theme." Professor Holt amazed the audience with his ability to seemingly read minds and recreate pictures and words that they had drawn which were unknown to him!

Monday through Thursday sessions were full of the usual highly vetted quality presentations on systems engineering related topics. I focused on the sessions related to MBSE and Agile Systems Engineering.

Edinburgh's public transportation included trolleys (or "trams"), trains, and double-decker buses, above.

The Board of Directors wishes to welcome the following new members to the Los Angeles Chapter of INCOSE.

Note: The information listed below is from the member directory and is based upon your initial membership application. If the information is not correct or complete, then please access your INCOSE profile (at www.incose.org) to update your information.

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Anne Murray	Raytheon	
Franz Kerekes	The Boeing Company	
David Garcia	LinQuest Corporation	
Vivek Hazari	Zodiac Aerospace	
Carol Neves	Northrop Grumman Corporation	
William Zschoche		
Kim Jacqueline	Northrop Grumman Corporation	
Michael Chow	Northrop Grumman Corporation	
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UPCOMING EVENTS

For more details on Chapter-sponsored events and registration, go to incose.org/los-angeles

INCOSE-LA Speaker Meeting
Highlights from the 2016 INCOSE International Symposium
Date: August 16, 2016 - 5:30 p.m. - 8:00 p.m.
Host site: The Aerospace Corporation, El Segundo
See article on page 3 for more details.

Third Quarter Strategic Planning Meeting
Date: August 20, 2016, 9:00 a.m. to 3:00 p.m.
Location: Caltech campus, Pasadena
Venue: Annenberg Center for Information Science and Technology, Room 105
Cost: FREE
See article on page 5 for more details.

Fifth Annual Mars (& Juno!) Update & LA/OC Society Expo
Date: September 10, 2016 - 1:00 p.m. - 5:00 p.m.
Venue: S-Café at Northrop Grumman
Location: South of Marine Ave at the end of Simon Ramo Drive, Redondo Beach, CA, USA
Cost: FREE
See article on page 4 for more details.

Orange County Area Networking Event
Date: Wednesday, September 21, 2016
5:30 p.m. to 8:00 p.m.
Location: Michael's Sports Pub & Grill
15192 Goldenwest Street, Westminster, CA 92683

Future INCOSE Networking Events Tentative Dates, and Locations:
November 16, 2016 – Ventura County
December 10, 2016 – INCOSE Holiday Party

Conference on Systems Engineering Research (CSER 2017)
Date: March 23 — 25, 2017
Location: The Crowne Plaza Hotel om Redondo Beach
See article on page 1 for more details

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: incose-la.org
Also like us on facebook!