

# NEWSLETTER



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



2004-14



2015-17

## Coming This September!



### What is special about September?

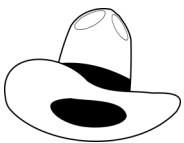
- The Autumnal Equinox? • World Series hype?
- Going back to college? • Football?
- Halloween candy and decorations on sale?

### How about: Opportunity?

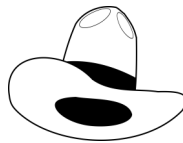
The Western States Regional Conference is an opportunity to improve your skillset and to expand your network without having to go all the way to events such as the International Symposium in Orlando. To learn more about this opportunity, see the advertisement on page 5.

You can also go to the conference webpage to learn more and to register.

<https://www.incose.org/wsrc2019>



See you  
there!



## Chapter Mid-year Review

Your Los Angeles Chapter of INCOSE continues working to meet the needs and interests of the membership with speaker meeting, tutorials, and the Western States regional conference — the latter to be held in September. Topics covered in speaker meetings have included the utility of the vision statement and the application of systems engineering by John Deere in agriculture — the latter a time-limited sampler of the systems engineering activities of an enterprise engaged in producing and facilitating a broad range of products around the world. More recently, the Chapter has hosted speaker meetings on the state of health care and space exploration by a private enterprise (see separate articles in the edition). The Programs Committee Chair, Nazanin Sharifi, is continuing working to fill out the remainder of the year with leaders in the profession speaking on a variety of timely topics.

The Director of Systems Engineering Education, Dorothy Benveniste, has been equally busy in trying to schedule tutorials, such as Dr. Hefner's tutorial on Model-Based Systems Engineering (see article on page 4), and reaching out to local universities in support of the Science, Technology, Engineering, and Math (STEM) initiative. In one example, Dorothy took the initiative to reach out to the faculty at California State University Long Beach to support their systems engineering activities.

Our outreach to STEM is a segue to one of the other values offered by the Chapter: an opportunity to volunteer. Mentoring students, supporting the Western States Regional conference, and providing feedback on how the Chapter can better provide value to the membership are but a few of the opportunities to volunteer and to build your network and to hone your skills as a professional systems engineer.

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## April Speaker Meeting



### Healthcare Systems Engineering



Dr. Oppenheim

The April Speaker Meeting featured the world-renowned Dr. “Bo” Oppenheim, a popular and well-spoken member of the INCOSE-LA Chapter. Dr. Oppenheim is a Professor of Systems Engineering at Loyola Marymount University (LMU) and has served in that capacity since 1982. He has 35 years of experience in aerospace and marine engineering. Dr. Oppenheim, a prolific writer, is the

author or co-author of six books and 30 publications on Lean Systems Engineering and on Program and Systems Engineering Integration. His background includes six years in the healthcare industry. In 2016 he created the Healthcare Systems Engineering (HSE) Master’s program at LMU.

Dr. Oppenheim opened his presentation with a discussion of the recent history of health care and the current (“imperfect”) state. He followed with a discussion of systems engineering and its applicability to healthcare: Healthcare Systems Engineering. Dr. Oppenheim concluded with a discussion of the attributes of an educational program to teach systems engineering to meet the needs of the healthcare industry, using the LMU master’s program as an example.

The description of the current state of healthcare included an amalgamation of statistics from a variety of sources and different countries that painted a dire picture of healthcare in the United States. Dr. Oppenheim presented a “short list of healthcare problems:

- Highly fragmented system, inefficient interfaces and handoffs, „dropped balls”.
- Burnout of providers
- Increasing complexity of healthcare – conducive to errors and accidents
- Bureaucratic overhead robbing providers of useful time with patients
- Wrong incentives still present, inflating healthcare costs
- Revolutions in population health, prevention and chronic care, home health, telemedicine, big data mining, biogenetics, artificial intelligence, IT, medical equipment – open extraordinary opportunities, but also present huge complexities
- Big progress in medical devices – presents interoperability challenge to designers and users (“everything is now cross connected”)
- Huge waste in all operations
- Shrinking budgets

Dr. Oppenheim opined that while the causes of these problems were varied, red states, Republicans, and insurance companies were highly culpable, and that “Obama Care” was a good step toward their resolution.

The discussion of systems engineering and its applicability to healthcare transitioned smoothly from fundamentals to illustrations of applications in healthcare. Dr. Oppenheim’s use of an N<sup>2</sup> diagram and of risk assessment resonated with the students at the California State University Long Beach student division as these were a recent part of their course work. The illustrations of potential applications included math modeling of operations, simulators of operations, (like a flight simulator) stochastic modeling of operations for studies of capacity, throughput, resources and costs, and the logical and functional modeling of complex operations.

**Neither traditional medicine nor MBA nor Master’s of Public Health education equips graduates to handle these challenges!**

The discussion of the attributes of the curriculum of a master’s program included a vin diagram comparing HSE with a typical MBA program and a typical Master’s of Public Health program. Dr. Oppenheim described the background for the LMU program and provided a link for those who might be interested in pursuing a Master’s of Healthcare Systems Engineering. The presentation concluded with a series of questions from the audience and an expression of thanks for the comprehensive presentation.

### Healthcare Systems: Some Complementary Data

The introduction of technology into a hospital included roll-around computer terminals which were used to load data regarding the patients. The doctors could use the terminals to review the data regarding any particular patient. In the Intensive Care Unit (ICU), these terminals were parallel to the monitors which were connected to the patient and provided data in the room and the nurses’ central facility.

There were some problems with these roll-around terminals.

The first problem was that they were programed with a set of mandated input fields. The inputs were independent of the physician’s professional opinion of what would be needed to provide the best care for the patient. Certain inputs could result in a government-mandated protocol – independent of the physician’s professional judgement.

Second, the terminals were fascinating attention magnets and social hubs. As a result, between the socializing and the time spent on non-value added tasks, the actual time spent performing the value-added tasks of patient care, the equivalent of touch labor, was reduced. This phenomenon is not unique to healthcare.

*(See “Government trumps physicians,” continued on page 3)*

*("Government trumps physicians," Continued from page 2)*

Beyond these terminals, many of the tasks performed were mandated by the Affordable Care Act.

An individual went to the hospital and encountered an illustration of the with the proverbial "help" from the bureaucracy. A blood test was administered. One part of the test showed that a particular parameter was out of limits – ever so slightly.

The parameter in question was not related to the reason for the trip to the hospital. "They" gave him the directed prescription drug.

The objections:

- The decision to prescribe a drug was based on "protocols" dictated by the "bureaucracy."

- The individual in question did not see a physician as a part of this decision process.

- The individual in question reviewed his history and noted that the "out of limits" condition was normal for him.

- The history review also showed that some labs cite different "limits" for the parameter in question; the most recent measurement, the one in the hospital, was well within the limits used by other laboratories.

The foolishness of presumed Government omniscience can be illustrated by the alarm levels settings on the real-time monitors an ICU. The settings, based on statistical norms, resulted in false alarms for patients' whose "normal for them" blood pressure, temperature, or pulse were outside those Government-dictated norms.

A registered nurse told of a hospital patient in his 90s and for whom the physician prescribed one ounce of spiritus frumenti daily. Apparently the prescribing physician felt a shot of booze was in the patient's best interest, considering his advanced age and terminal condition. Modern protocols would mandate an intervention program, which might have hastened the old man's death, or, at least, make his remaining time on Earth unnecessarily uncomfortable.

A patient, when asked if he consumed alcohol and, if so, how much, let his annoyance with the seemingly unending list of question gets the better of himself and answered, "lots!" Once that answer was in the system, the physician was mandated to prescribe an alcohol intervention program.

Physicians have been penalized for prescribing opioids – based on statistics and with no regard, or contact, with the patients.

According to comments from professionals in the field of medicine, plus a few direct observations, the "If [THIS] then [THAT]" algorithms, defined and dictated by fiat, are permeating the practice of medicine. To this can be added the mandated collection of data that is non-value added in terms of diagnosing and treating a particular patient's need. We fuss about the cost of medical care. One must wonder how much is spent to satisfy the Affordable Care Act dictates and consequential bureaucracies, sometimes to the detriment of the value-added tasks protecting a patient's health and privacy.

## Interorbital Systems

To the Moon, Mars, and Beyond,  
from the Mojave Desert

### May Speaker Meeting

By Dr. J. Shelley

Randa Milliron's presentation during the May 14, 2019 speaker meeting spurred significant and wide-ranging discussions from STEM education to business models to technical details of filament winding composite tanks. Randa Milliron is co-owner of Interorbital Systems, a woman-owned small business launch vehicle manufacturer and launch services provider for small payloads. Interorbital Systems operates out of the Mojave Air and Space Port in Mojave, California (in the Edwards Air Force Base air space). While Interorbital started in 1996 – relatively recently in the rocket propulsion era that began in the closing days of WWII – the enterprise draws its heritage from the mentorship of rocket industry innovators like Marguardt and North American, which produced the X-15 hypersonic airplane tested at Edwards AFB in 1959.

Randa's talk covered the Interorbital's products and rocket development history concentrating on a "learning by building" approach to developing small launch vehicles for low cost orbit insertion. Pragmatic propellant selection and straight forward technology application chosen to be easily manufactured and robust has lead to the safe Common Propulsion Module based modular Neptune vehicle concept that can launched by two people with a laptop. The Common Propulsion Module itself is a sub-orbital vehicle reaching a 310 mile apogee with a 250 kg payload while the Neptune 5 four stage configuration can insert 100 kgs into a polar orbit. The company has recently launched a product line of cube-sats and tube-sats aimed primarily at the STEM educational market that relieve small student teams of the burden of designing launch vehicle interface, power systems, and basic satellite structural design. Students can concentrate on designing Arduino compatible experiments of 1 kg or 1.33 kgs for insertion into a self-decaying polar orbit. The presentation ended with videos of several of Interorbital Systems test firings and launches.

Take-aways from this presentation were the importance of mentorship during business start-up and product development, the value of maintaining commitment to and consistency with system requirements and product goals, and that rockets are just cool.

For more information about Interorbital Systems check out their website: [www.Interorbital.com](http://www.Interorbital.com)

*Dr. Jeigh Shelly is a member of the California State University Long Beach faculty at their Antelope Valley facility. She is very knowledgeable about rocket science and is passionate about reaching young students and encouraging them to pursue a technical career. She is also the voice of the Antelope Valley remote site during speaker meetings. Ed.*

The biggest concern for any organization should be when its most quiet people become quiet. Several attributions



## Training Opportunity Requirements Development Tutorial June 8, 2019

The Chapter is sponsoring a tutorial on requirements development. Some particulars:

**INSTRUCTOR:** Dr. Rick Hefner

**DATE:** Saturday, June 8, 2019

**VENUE:**

Manhattan Beach Community Church  
Community Hall building  
303 South Peck Avenue  
Manhattan Beach, California 90266

Due to space limitations, attendance at the host site is limited to INCOSE members on a first-come, first-serve basis. Virtual attendance will be available to all.

**COST:** On-Site: \$50. On-site attendance open only to INCOSE members; use PromoCode **MEMBERSONLY** and enter member number.

Remote Online: \$50. Open to anyone; enter "None" at the member number (even if you are a member but plan to attend remotely).

**ABSTRACT:** Requirements are one of the most critical aspects of modern systems development and also one of the least understood. This tutorial will present a comprehensive overview of industry best practices for requirements development, covering elicitation, analysis, validation, specification, allocation, and verification. An introduction to model-based techniques for developing requirements will also be provided. Attendees will leave with a thorough understanding of techniques and tools for handling common requirements challenges.

**BIOGRAPHY:** Rick Hefner, PhD, works at the Caltech Center for Technology and Management Education (<http://ctme.caltech.edu>), where he helps industry professionals and high-tech companies understand and apply systems engineering concepts. He has over 40 years of experience in the aerospace, communications, electronics, and health sciences industries. This includes work with AeroVironment, Applied Physics Laboratory, Applied Materials, Ares Management, Boeing, DRS Technologies, Halliburton, Herbalife, Honeywell, Jet Propulsion Laboratory, John Deere, L-3 WESCAM, Maytag, Motorola, Pacific Bell, Raytheon, Schlumberger, Southern California Edison, St. Jude Medical, Toshiba, U.S. Navy, and Xerox.

Dr. Hefner is credited with over 100 publications and presentations. He earned his PhD from the University of California, Los Angeles, in applied dynamic systems control, and his master's and bachelor's degrees from Purdue University in interdisciplinary engineering.

### **SCHEDULE DETAILS:**

- 8:00 a.m. Breakfast: 8-8:30 am
- 8:30 a.m. Introduction to Requirements Development
- 9:00 a.m.: Requirements Elicitation
- 10:00 a.m. Requirements Analysis
- 11:00 a.m. Requirements Validation
- 11:30 a.m. Lunch

- 12:30 p.m. Requirements Specification and Allocation
- 1:30 p.m. Requirements Verification
- 2:00 p.m. MBSE approaches to Requirements
- 2:30 p.m. — 3:00 p.m.: Retrospective

### **REGISTRATION PARTICULARS:**

Link: <https://tinyurl.com/LA8JuneTutorial>

To register for attending on-site (members only) use promo code "MEMBERSONLY" and enter your member number.

To register for attending as a remote-on-line participant, non-members should enter "None" as the member number. Information for the remote link will be emailed to registered participants the evening of July 7, 2019.

For additional information contact the Training Director for the Chapter, Dorothy Benveniste at [djbenven@ca.rr.com](mailto:djbenven@ca.rr.com).

## MBSE/SysML Training in March

*By Dorothy Benveniste*

The INCOSE-LA Chapter presented a lecture on Model-Based Systems Engineering (MBSE) and Systems Modeling Language (SysML) on Saturday, March 16, 2019. This all-day lecture included hands-on use of the NoMagic Cameo Systems Modeling tool. The lecture was held at the Dassault Systems office in Long Beach, California. Participation included both in-person and virtual attendees.

The training day began with an overview of MBSE and SysML. SysML is a general-purpose graphical modeling language for specifying, analyzing, designing, and verifying complex systems that may include hardware, software, information, personnel, procedures, and facilities. The afternoon was devoted to guiding participants with hands-on SysML processing using the NoMagic Cameo Systems Modeler.

This topic had current relevance. The INCOSE *SE Vision 2025* defines model-based systems engineering (MBSE) as the formalized application of modeling to support system requirements, design, analysis, verification and validation activities beginning in the conceptual design phase and continuing throughout development and later lifecycle phases. These models provide an efficient way to explore, update, verify, and communicate system aspects to stakeholders, while significantly reducing or eliminating dependence on traditional documents.

Approximately 50 participants attended, either in-person or as virtual participants. They rated this training as highly effective and several follow-on training sessions on this subject were requested for small systems engineering groups.

Please contact Dorothy Benveniste, INCOSE-LA Training Director, with any questions at [djbenven@ca.rr.com](mailto:djbenven@ca.rr.com).



# INCOSE Western States Regional Conference

*Systems Engineering Relevance:  
Time for a Sea Change!*

**13-15 September 2019**

**Loyola Marymount University, Los Angeles, California**

**International Flavor** • Prominent Speakers • Panels, Presentations, Tutorials

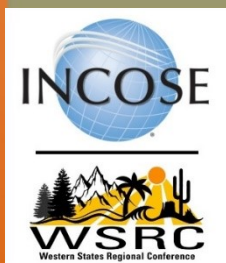
## Systems Engineering Topics

- Model-Based Systems Engineering (MBSE)
- Agile
- Attracting and Developing Tomorrow's Workforce
- Natural and Social Systems
- Transportation Systems
- Large Observatories
- Resilient and Sustainable Systems
- Systems Research and Analysis
- Application to Healthcare and Medical Devices

**Convenient to Los Angeles International Airport!**

For the latest information, including price and speakers, see:

<https://www.incose.org/wsrc2019>



Hosted by the INCOSE Los Angeles Chapter  
in collaboration with the Colorado Front Range,  
San Diego, San Francisco Bay Area, Seattle  
Metropolitan, and Wasatch Chapters.





Looking for a career change to a top  
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Great companies are built on great products  
Constantly think how you can do things better  
If you need inspiring words, don't do it  
Pursue what you're passionate about  
Life is too short for long term grudges  
It's important to like your coworkers  
Ordinary people can be extraordinary  
Don't be afraid of new arenas  
You have to be pretty driven to make it happen  
Persistence is very important  
Most people can learn a lot more than they think they can

Attributed to Elon Musk



## Speaker Meeting Photographs

The photograph above is of Dr. Oppenhiem (center) with several of the on-site attendees at the April Speaker Meeting.

The photograph below is of a few of the attendees at the May Speaker Meeting.



## Want to attend the next speaker meeting but can't make it to the host site? Not a problem.

Several remote sites are available, as is virtual attendance. Remote attendance at the March Speaker Meeting was geographically dispersed (San Diego, San Francisco, Virginia, Texas, Ventura, Antelope Valley), and included academic sites (CSU Dominguez Hills, CSU Long Beach), and industrial sites (Northrop Grumman). Check out the options as a part of registering in the Reflector Notice.

**INCOSE-LA Chapter NEWSLETTER**

Vol. 17: Issue 3, June — July 2019

**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 the member directory (at [www.incose.org](http://www.incose.org)) to update your information.

Name	Organization
Jerimiah Harris	LinQuest Corporation
Chanceleir Schilling	University of Southern California
Marc Goldsmith	LinQuest Corporation
Eran Eliezer	LinQuest Corporation
Ryan Elliott	SAIC
Sarah Graves	SAIC
David Ho	SAIC
Junni Kim	
John Langer	The Aerospace Corporation
Rob Holland	Northrop Grumman Innovation Systems
Lance Baird	Johns Hopkins University
Umesh Ketkar	Loyola Marymount University
Leor Alon	
Young Min Kim	Vyair Medical
David Kouchnerkavich	LinQuest Corporation
Chris Whang	LinQuest Corporation
Yoav Rosenberg	Moog
Christopher Chase	Lockheed Martin
Blaine Rieger	Loyola Marymount University

**2019 Board of Directors**

Elected Officers			Elected At-large Directors		
President	Mark McKelvin	mckelvin@usc.edu	Membership Chair	Karen Grothe	Ksgrothe@yahoo.com
Vice President	Mark TenEyck	Mark.teneyck@3ds.com	Programs Committee Chair	Nazanin Sharifi	n.sharifi77@gmail.com
Immediate Past President	Rick Hefner	rhefner@caltech.edu	Systems Engineering Education	Dorothy Benveniste	djbenven@ca.rr.com
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Treasurer	Lin Yi	Lin.yi.dr@ieee.org	Communications Committee Chair	Scott Birtalan	scott.birtalan@ngc.com
Appointed Positions					
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**

Vol. 17: Issue 3, June — July 2019



# INCOSE-LA Chapter      NEWSLETTER

Vol. 17: Issue 3, June — July 2019

Return Address:

**PO Box 10969  
Westminster, CA 92685-0969**

## 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](http://www.incose.org/los-angeles) . Like us on Facebook

### **Second Quarter Strategic Planning Meeting**

*The members' opportunity to be heard and contribute*

Saturday, June 1, 2019

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*

### **June Speaker Meeting**

Dr. Mark McKelvin

Tuesday, June 11, 2019

The Aerospace Corporation

El Segundo, California

*Standby for a Reflector Notice in your e-mail*

### **Requirements Tutorial**

Dr. Rick Hefner

8:00 a.m. to 3:00 p.m.

Saturday, June 8, 2019

Manhattan Beach Community Church

Lunch included

Cost: \$50.00; limited on-site attendance

*Standby for a Reflector Notice in your e-mail*

### **INCOSE International Symposium**

July 20 — 25, 2019

Orlando, Florida

*For more information, go to*

*<https://www.incose.org/symp2019/home>*

### **Western States Regional Conference**

Systems Engineering Relevance:

Time for a Sea Change!

September 13 — 15, 2019

Loyola Marymount University

Los Angeles, California, overlooking Marina Del Rey

*See article and advertisement on pages 1, and 5*

*Standby for a Reflector Notice in your e-mail*

### **Conference on Systems Engineering Research**

March, 2020

The University of Southern California

*Standby for a Reflector Notice in your e-mail*