What is special about September?

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

How about: 

The Western States Regional Conference is an opportunity to improve your skillset and to expand your network. Not to mention going to all the way to Orlando. For 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!

Inside This Edition

<table>
<thead>
<tr>
<th>Employment Opportunities</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Base 2 Solutions</td>
<td>7</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Features</th>
<th>9</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chapter Award</td>
<td>1</td>
</tr>
<tr>
<td>June Speaker Meeting: System Architecting</td>
<td>2</td>
</tr>
<tr>
<td>Chapter Communications</td>
<td>7</td>
</tr>
</tbody>
</table>

Education and Conferences

| Western States Regional Conference | 1, 5 |
| August Speaker Meeting: Collaborative Governance | 3 |
| UCI Division of Continuing Education | Systems Engineering in the Modern World | 4 |
| Caltech Systems Engineering Programs | 7 |
| Eighth Annual Mars Rover Update | 8 |

Whom to Contact

9

Upcoming Events

Back page
**System Architecting**  
*By Dr. Mark McKelvin  
June Speaker Meeting*

By Karen Grothe

INCOSE defines system architecture as the fundamental and unifying system structure defined in terms of system elements, interfaces, processes, constraints, and behaviors. The Department of Defense (DoD) definition words it slightly differently as “the structure of components, their relationships, and the principles and guidelines governing their design and evolution over time.” For a third perspective, the ANSI/IEEE 1471-2000 standard defines system architecture as “the fundamental organization of a system, embodied in its components, their relationships to each other and the environment, and the principles governing its design and evolution.” INCOSE Los Angeles chapter president Dr. Mark McKelvin referenced all of these to define architecture at the beginning of his presentation on system architecting. He then explained the process for architecting: characterizing and selecting the problem, generating and selecting an overall concept, and evaluating concepts for feasibility or fitness for use.

Architecting is used to help develop both requirements and design. We do architecting to help us understand system interactions and reduce misunderstandings that result from complexity. One way to gain understanding is through views, such as timing, functions, or hardware. An example of what can happen when architecting doesn’t happen can be seen at the Winchester Mystery House in San Jose, CA, where one can find doors leading to nowhere, windows overlooking other rooms, and stairways leading to the ceiling.

Dr. McKelvin pointed out that architectures are not unique because more than one architecture can satisfy the needs, and an architecture can be implemented in more than one way. He also wanted us to keep in mind that architecting is a decision-making process, not diagrams or documents. There are four general methods for architecting. The two science-based, deductive methods are Normative, where hard rules are provided and success is defined by compliance to rules; and Rational, where architectures are defined from objectives utilizing optimizations and formal techniques such as structured or object-oriented techniques. Two art-based, inductive methods are Participative, where solutions are derived from group consensus; and Heuristics, where architectures are based on lessons learned and “soft” rules developed from experience.

An approach to architecting which Dr. McKelvin presented involved abstraction, decomposition, and construction. We want to use abstraction to eliminate unnecessary details with respect to the goal at hand. Decomposition breaks system development into semi-independent parts (“divide-and-conquer”) and separation of concerns (i.e., “what” vs. “how”, computation vs. communication). Construction is used to constrain the design space and define transformations from high-level abstraction to final implementation, supported by design automation tools. During construction, we define verified, strongly encapsulated components with well-defined interfaces, which enables reuse.

At this point, Dr. McKelvin introduced Platform-Based Design (PBD), which he described as a “meet-in-the-middle” design process where successive refinements of specification meet abstractions of potential implementations. A platform is an abstraction layer that hides the details of several possible implementation refinements of the underlying layers. In PBD, a functional model (what the system is supposed to do) is mapped to an architecture component model (how the function is realized). The mapping propagates constraints from above to meet performance estimations from below.

Platform-based design can be combined with component-based design where strongly encapsulated design entities (components) have rigorous interface specifications. These components can be used to define a set of platform models in PBD. This architecting approach is conducive to model-based systems engineering (MBSE) which allows us to integrate data through the systems architecture model. Thus, document views, tabular views, block diagrams, and analyses can be derived from a framework (a structure where information is stored) provided by the architecture model.

![Diagram](image)

**Figure 1**: Platform Based-Design. Source: Sangiovanni-Vincentelli, A. “Is a unified methodology for system-level design possible?” Design & Test of Computers, IEEE 25.4 (2008): 346-357.

INCOSE-LA Chapter NEWSLETTER  
Vol. 17: Issue 3, June — July 2019
August Speaker Meeting
Collaborative Governance

Abstract:
The American homeland security enterprise was established eleven days after the September 11, 2001 terrorist attacks. The Department of Homeland Security (DHS) unified organizations from 22 federal agencies. In addition to responding to unprecedented technological challenges, DHS leadership has forged linkages between Federal, state and regional entities, some of which had previously been prohibited from collaborating, or even sharing information.

Collaborative governance is the ascendant paradigm in Public Administration and Public Policy. It aims to empower stakeholders with competing interests to arrive at a consensus and make recommendations regarding a policy or program. Dr. Boadi posits that collaborative governance processes can be enhanced through the application of systems and systems-of-systems engineering principles and methodologies.

Biography:

Dr. Antonia Boadi is a member of the Physics Department at California State University Dominguez Hills (CSUDH) where she serves as Director of the Intelligence Community Center of Academic Excellence. She completed a Ph.D. in Electrical Engineering at the University of Southern California. Since 2001, she has served as Principle Investigator on an uninterrupted stream of external grant funding from Verizon, U.S. Department of Education, Office of the Director of National Intelligence, U.S. Department of Homeland Security and the Nuclear Regulatory Commission.

Dr. Boadi developed the curriculum for CSUDH’s graduate Systems Engineering program which, pending final authorization, will welcome its first cohort during the 2020-2021 academic year. She founded PROWESS, the PaRtnership of Women Excelling as Scientists and Scholars, a puberty-to-Ph.D. pipeline with funding from the Verizon Foundation.

Dr. Boadi was awarded a Career Development Grant by the Department of Homeland Security to pursue a second doctoral degree in Public Policy with an emphasis in Counter-Terrorism. She is a member of INCOSE’s Anti-Terrorism Working Group.

This presentation discusses the generic application of systems engineering and systems-of-systems principles and methodologies to notional nuclear/radiological counter-terrorism scenarios and activities.

WHEN: Tuesday, August 13, 2019
SCHEDULE:
5:15-5:30 p.m. sign-in and registration
5:30-6:00 p.m. networking, and refreshments
6:10-6:15 p.m. introductions
6:15-6:30 p.m. working group presentation (TBD)
6:30-7:30 p.m. guest speaker presentation
followed by questions and answers

INCOSE-LA is starting a new Networking Initiative to take full advantage of the time allotted for networking, so please be on-time for introductions and any announcements.

WHERE:
HOST SITE: The Aerospace Corporation, 200 North Aviation Boulevard, Bldg. D8, Room 1006A, El Segundo, CA 90245
Host: Deborah Cannon, 310-336-8341 (Office), 714-477-3755 (Cell)

Directions to host site: Enter at the booth off of Aviation (north of El Segundo Blvd). The guard will direct you to parking at the front of the building. Enter the front door and guard will badge you in (you need to be registered – see link above.) When you arrive please wait in the lobby in Building D8 please check in with Security, you will need to present identification and a visitor badge will be issued. An Aerospace Corp employee will then escort you to the Conference room.

REMOTE SITES:
Northrop Grumman Azusa, CA: Management Center: Host: Maria Alvarez-Ruiz (310-877-9859) and Samantha Massa
Ricardo Defense, 175 Cremona Dr. Suite 140, Goleta, CA 93117: Host: Paul Stowell (805-680-7397, 805-869-6127)
Lancaster University Center: 45356 Division Street, Lancaster, CA 93535, room 614: Host: J Shelley (J.Sherley@csulb.edu)

VIRTUAL ATTENDEES: Register as an individual virtual participant, or attend an active remote site.

COST:
INCOSE Members (and virtual attendees): FREE.
Non-members at host site (refreshments provided): $10
CAB Associate Members at host site $5

REGISTRATION WEBSITE: http://events.constantcontact.com/register/event? lac=1&lrcid=ao7eglerzactb28ob1a

INCOSE-LA Chapter NEWSLETTER
Vol. 17: Issue 4, August — September 2019
3
Plan, coordinate, and manage team efforts that translate user and market needs into system requirements. Develop effective design solutions that can achieve cost, schedule, risk and performance goals.

Next course starts Sept. 30, 2019
Foundations of the Systems Engineering Process

Program Benefits
- Optimize product development and service deployments
- Tailor the general systems engineering approach to specific markets like IoT, automotive and others
- Improve your organization’s operational efficiency
- Reduce project and program risks while keeping on schedule and under budget
- Write and manage effective requirements specifications using the processes of elicitation, analysis, negotiation, validation, and traceability
- Develop innovative approaches for systems design and integration
- Utilize simulation-based engineering to optimize development and deployment efforts
- Define verification and validation programs
- Identify, prioritize, and select relevant solutions to solve complex problems and processes
- Prepare for industry certification

Learn more: ce.uci.edu/systemseng
Jackie Badwah, Program Manager
jdbadwah@uci.edu

10% discount for INCOSE members
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 Systems Engineering
- Current Perspectives in Systems Engineering
- Attracting and Developing Tomorrow’s Workforce
- Natural and Social 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 Cascade, Colorado Front Range, San Diego, San Francisco Bay Area, Seattle Metropolitan, and Wasatch Chapters.

EARLY BIRD RATES AVAILABLE THROUGH AUGUST 15TH!
Our Technical Program

Friday
Full Day Workshop (First Half): *CSEP Examination Preparation Class* (additional charge)
Half Day Workshop honing soft skills: *Systems Engineering to the Rescue*

Half-Day Tutorial: *Correcting Misperceptions of Systems Engineering Practices*

Saturday
Multi-track Presentations and Panel Discussions
Systems Engineering Professional Development Day (SE PDD) Track
Regional Remote Satellite Sites Will be Available
Full Day Workshop (Second Half): *CSEP Examination Preparation Class*
Networking Reception and Optional Dinner Banquet
Keynote Speaker: LtCol Kellie Brownlee, AF Space Future Ground Systems

Sunday
Keynote Speaker: Dr. George Angeli, SE for Giant Telescope Observatories

Multi-track Presentations and Panel Discussions
Systems Engineering Professional Exam for INCOSE ASEP/CSEP Certification
Optional Tour: NASA/Northrop-Grumman Webb Space Telescope (if accessible)

**Location:** Loyola Marymount University, Marina del Rey, Los Angeles, CA
Affordable 3-day registration fee includes lunches and mid-day breaks, hotel shuttle
A block of rooms has been reserved at The Renaissance Hotel, LA Airport

**For further details and registration go to the WSRC website at:**
[https://www.incose.org/wsrc2019](https://www.incose.org/wsrc2019)

Also an optional workshop (2 days: **Thursday and Friday**): *Systems Engineering Bootcamp: Taking Systems Engineering to the Next Level*
Looking for a career change to a top Glassdoor rated company? Come join us!

We are looking for talented engineers across a number of disciplines to join our teams in our Bellevue, WA and Brea, CA locations. Check out our careers (at base2s.com/about-us/careers/) to explore our current openings in southern California and the Pacific northwest.

2020 elections are coming!
An Opportunity with the takeaway of invaluable experience.

Chapter Communications

Have you looked at the Chapter webpage – lately?

Go to the Chapter webpage at:
www.incose.org/los-angeles

- Videos on training, insights, and INCOSE events
- Local training and networking events
- Speaker meetings
- Conferences

Check out the Chapter’s website, for the latest information (or links) and these and other topics of interest to the systems engineering professional who wants to grow within the profession.

The potential is growing. Want to interest a youngster in engineering? Go to the Chapter website and follow the links (Now on YouTube) to the YouTube video, The Engineer in a Hat, produced by our colleagues in Britain.

If you prefer to receive the Newsletter in hardcopy...

To save cost, the primary method for distribution of the Newsletter is by e-mail. If you would prefer to receive a hardcopy by mail, please email us at: newsletter@incose-la.org.

“Explanations” given to Aircrews

- You are the only crew available
- No need to worry about that — we will test it in the lab
- The system is O.K. — it’s probably just the gauge
- Of course it’s good — it just came back from depot
- It’s not quite right, but we will have it ready in time for pre-flight
- There is no need to test the software in flight — it has been tested in the simulator

There is still time to submit a proposal to WSRC: go to https://easychair.org/cfp/wsric2019
Volunteers needed as technical reviewers of the proposals. Contact Dr. Rick Hefner at: rhefner@caltech.edu

INCOSE-LA Chapter NEWSLETTER
Vol. 17: Issue 4, August — September 2019
8th. Annual Mars Rover Update and Professional Society Expo!

WHEN: Saturday, Sept 21, 2019
TIME: 1:00 p.m. to 5:00 p.m.
WHERE: S Café at Northrop Grumman, Redondo Beach
(Aviation Boulevard, east on Marine Avenue south on Simon Ramo Drive)
COST: FREE (Parking & Admission)!

GUEST SPEAKER:
NASA-JPL Curiosity Mission Engineer (Charles Baker)

• The Latest, Amazing Curiosity Engineering and Science Results
• Curiosity Landing Site Scale Model, Hardware and Mock-ups
• FREE Bottled Water and Healthy Snacks
• Special Tours of James Web Space Telescope and other Space Hardware
• Exhibit Tables from Several Los Angeles and Orange County Professional Societies (Planetary Society, IEEE, INCOSE, AIAA, SWE, IET, AFCEA, OCVitalLink, FSEA, SAE, and OSSC, among others!)

*Kids Activities (Straw Rocket Contest, Robotic Games and More!)
*Opportunities to ask Questions
*Closing FREE Raffle (“Space-Related”) Prizes!

RSVP: https://tinyurl.com/2019MarsExpo
Questions: fredlawler@hotmail.com

This is also a Los Angeles County and Orange County, Area-Wide Outreach for Science, Technology, Engineering & Math (STEM), So All Kids, Students, and Adults are Most Welcome!!!
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) to update your information.

<table>
<thead>
<tr>
<th>Name</th>
<th>Organization</th>
</tr>
</thead>
<tbody>
<tr>
<td>Robin Rose</td>
<td>Base2 Solutions</td>
</tr>
<tr>
<td>Yong Chen</td>
<td>Shanghai Jiao Tong University</td>
</tr>
<tr>
<td>Dan Bergstrom</td>
<td>Alion Sciences and Technology</td>
</tr>
<tr>
<td>Yong Wu</td>
<td>Northrop Grumman Corporation</td>
</tr>
<tr>
<td>David Utley</td>
<td>CEB Metasystems, Inc.</td>
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<tr>
<td>Justin Dixon</td>
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<tr>
<td>Nicole Pelliccia</td>
<td>Lockheed Martin</td>
</tr>
<tr>
<td>Kamran Ossia</td>
<td>Fresca Medical</td>
</tr>
<tr>
<td>Behnam Afsharpooya</td>
<td>Dassault Systems</td>
</tr>
<tr>
<td>Tim Bode</td>
<td>LinQuest Corporation</td>
</tr>
<tr>
<td>Marc Carithers</td>
<td>LinQuest</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Elected Officers</th>
<th>Elected At-large Directors</th>
</tr>
</thead>
<tbody>
<tr>
<td>President</td>
<td>Mark McKelvin</td>
</tr>
<tr>
<td>Vice President</td>
<td>Mark TenEyck</td>
</tr>
<tr>
<td>Immediate Past President</td>
<td>Rick Hefner</td>
</tr>
<tr>
<td>Secretary</td>
<td>Phyllis Marbach</td>
</tr>
<tr>
<td>Treasurer</td>
<td>Lin Yi</td>
</tr>
<tr>
<td>Membership Chair</td>
<td>Karen Grothe</td>
</tr>
<tr>
<td>Programs Committee Chair</td>
<td>Nazanin Sharifi</td>
</tr>
<tr>
<td>Systems Engineering Education</td>
<td>Dorothy Benveniste</td>
</tr>
<tr>
<td>Ways and Means Chair</td>
<td>Stephen Guine</td>
</tr>
<tr>
<td>Communications Committee Chair</td>
<td>Scott Birtalan</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Appointed Positions</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Newsletter Editor</td>
<td>Jorg Largent</td>
</tr>
<tr>
<td>Technical Society Liaison</td>
<td>Shirley Tseng</td>
</tr>
<tr>
<td>Chapter Awards Manager</td>
<td>Rick Hefner</td>
</tr>
<tr>
<td>Professional Networking Chair</td>
<td>Scott Birtalan</td>
</tr>
<tr>
<td>Representative to the SF Valley Engineer’s Council</td>
<td>Stephen Guine</td>
</tr>
<tr>
<td>Student Division Ambassadors</td>
<td>Scott Birtalan</td>
</tr>
<tr>
<td>Reflector Manager</td>
<td>Deborah Cannon</td>
</tr>
<tr>
<td>Social Media Manager</td>
<td>Doris Gebelein</td>
</tr>
<tr>
<td>New Member Ambassador</td>
<td>Collette Kurtz</td>
</tr>
<tr>
<td>Volunteer Coordinator</td>
<td>Karen Miller</td>
</tr>
</tbody>
</table>

INCOSE-LA Chapter NEWSLETTER
Vol. 17: Issue 4, August — September 2019
**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

<table>
<thead>
<tr>
<th>Event</th>
<th>Details</th>
</tr>
</thead>
</table>
| **August Speaker Meeting**                 | Collaborative Governance  
Dr. Antonia Boadi  
Tuesday, August 13, 2019  
The Aerospace Corporation  
El Segundo, California  
[Learn more and register at](http://events.constantcontact.com/register/event?llr=l4ihvgeab&oeidk=a07egferzac1b280b1a) |
| **Strategic Planning Meeting**             | The members’ opportunity to be heard and contribute  
Saturday, September 7, 2019  
9:00 a.m. — 1:00 p.m.  
Manhattan Beach Community Church  
303 S Peck Avenue  
Manhattan Beach, CA 90266  
Lunch included  
No cost for members  
*Standby for a Reflector Notice in your e-mail* |
| **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 6 and 7  
Learn more and register at*  
[https://www.incose.org/vsrc2019](https://www.incose.org/vsrc2019) |
| **8th. Annual Mars Rover Update and**      | Professional Society Expo  
Saturday, September 21, 2019  
1:00 p.m. to 5:00 p.m.  
The Northrop Grumman Corporation  
Redondo Beach, California  
*See advertisement on Page 8* |
| **October Speaker Meeting**                | Dr. Rick Hefner  
Tuesday, October 8, 2019  
The Aerospace Corporation  
El Segundo, California  
*Standby for a Reflector Notice in your e-mail* |
| **Conference on Systems Engineering**      | Research  
March, 23 — 25, 2020  
The University of Southern California  
*Standby for a Reflector Notice in your e-mail* |