



International Council on Systems Engineering

A better world through a systems approach

Members NEWSLETTER

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The International Council on Systems Engineering

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A MESSAGE FROM THE INCOSE PRESIDENT

Dear INCOSE Community,

As 2024 draws to a close, we look back on a remarkable year for INCOSE and the broader systems engineering community. This year has been marked by milestones, progress, and collective achievements that demonstrate the strength and vibrancy of our global network.

The year began with a record-breaking International Workshop in Torrance, California, where INCOSE leaders and members from around the globe came together to collaborate across working groups, committees, and initiatives. This event offered an opportunity to share updates on our strategic development and organizational transformation, highlighting our collective potential to achieve ambitious goals by working together as “One INCOSE,” a united global community. A key milestone was the launch of our new staff organization under the leadership of Steve Records, tasked with delivering enhanced services for our global membership and



providing dedicated support to our volunteer leaders.

In July, the International Symposium in Dublin was another milestone, showcasing a phenomenal technical program fueled by the highest number of submissions in our history and attended by over 1,000 participants. At this event, we unveiled the final version of our strategic plan, affirming our commitment to being the world’s trusted authority and forum for the practice, science, and art of systems engineering. This strategic vision is already shaping decisions and has played a pivotal role in guiding the development of our 2025 Annual Operating Plan.

Our community’s growth and maturity were evident as we celebrated significant anniversaries this year: the 30th anniversaries of SESA (our Australian chapter) and the UK chapter, along with the 20th anniversary of our Systems Engineering Certification Program, now boasting over 4,000 certified SE professionals. These milestones reflect the enduring impact of INCOSE’s efforts.

This year’s newsletters have showcased also the richness of our local, national,

and regional events across all continents, alongside our international flagship events. These, combined with an expanding portfolio of virtual events, are vital in fostering the strong personal connections that make INCOSE so unique.

We have continued to evolve our services and strengthen organizational leadership. New initiatives like the SE-Lab and the Professional Development Portal (PDP) are thriving, while our core products are being maintained and updated. Highlights include the release of SEBoK 2.11, the SETDB, and Version 2 of the Needs and Requirements Manual.

On the global stage, INCOSE’s collaboration and visibility have reached new heights. We became an international member of the World Federation of Engineering Organizations (WFEO) and are leading a WFEO working group focused on “Empowering Engineering Disciplines Through Systems Engineering.” Events like World Engineering Day on March 25 and the WFEO Global Engineering Congress on October 25 will further amplify our presence within the global engineering community. Additionally, our Smart Cities Initiative participated in the 2024 Smart City Expo World Congress, which brought together more than 25,000 cross-industry professionals to shape better cities. INCOSE was the

only international professional organization represented, contributing according to our slogan, “A Better World Through a Systems Approach.”

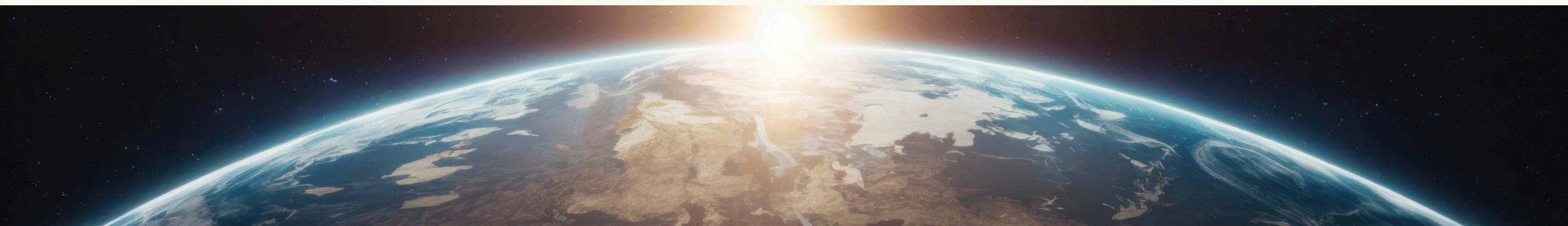
None of this would have been possible without the enthusiasm, dedication, and tireless contributions of our global members and extraordinary volunteer leaders at all levels. I extend my heartfelt gratitude and deepest respect to each of you. Your efforts make INCOSE truly exceptional, and I am confident in our future and the future of systems engineering.

As the year ends, let us reflect on the connections, achievements, and shared values that unite us as a global community. May this holiday season bring joy, gratitude, and hope to you and your loved ones. May the New Year be filled with opportunities, success, and good health for all.

Looking ahead to 2025, I am filled with optimism and excitement. I hope to see many of you in Seville at our first International Workshop outside the United States and throughout the many events planned for the coming year.

Warmest wishes for the holiday season and a prosperous New Year,

Ralf Hartmann



A MESSAGE FROM THE EXECUTIVE DIRECTOR

Hello INCOSE Members,

Last quarter, I noted that 2024 was a year of transition and planning. While we have spent a good amount of time creating our new strategic plan, we have also been busy creating new partnerships and laying new foundations for INCOSE to grow. In 2024, we joined the World Federation of Engineering Organizations (WFEO). Since we joined, INCOSE has led an initiative in WFEO to set up a Systems Engineering Committee, which was recently approved. We are excited to lead this committee within WFEO to bring awareness of SE to all of the other non-SE organizations that are members, position INCOSE as the SE leader, and expand our membership throughout the world. For those of you who have a passion for advocating SE (to non-systems engineers), this may be a great opportunity for you to engage!

We have also been laying new foundations for INCOSE internally. Board President Ralf Hartmann, President-Elect Mike Watson, and myself, along with many other members of the INCOSE Board, have been intentional in traveling to and meeting with INCOSE members around the world. The SE practice is what attracts



our members, but it is our culture that unites us as a global organization, fosters collaboration, and helps retain members. Over the past year, we have visited our members in Australia, Singapore, Japan, France, the UK, Germany, the Netherlands, and across the US, among others. We believe in the idea of One INCOSE, and we will continue to work to support members, chapters, and leaders wherever we exist.

Lastly, we continue to evolve and create new ways for INCOSE engagement. For our members, we still have our Working Groups and technical publications for members to join, but we are continuing to ideate new services to deliver value too. Our SE Lab is a perfect example – members can explore and trial products from vendors and collaborate with fellow members in building new models. We have professional development opportunities like one-to-one mentoring at our Technical Leadership Institute. We are also creating new opportunities for our sponsors and partners to support you and INCOSE. We are expanding opportunities for sponsors to participate in events like the IS and IW. The aforementioned SE Lab is driven by product donations from partners. Sponsors, like Dassault, are engaging with INCOSE to support global events and programs under a single agreement rather than having to work with 50 different INCOSE entities.

INCOSE is the global Systems

Engineering community. Undoubtedly, the local work chapters conduct is invaluable, the impact our sponsors have on our ability to create additional services is invaluable, and the culture we create to be inclusive must be invaluable as well. I wish you all a Happy New Year and a great start to 2025.

Steve Records

“The SE practice is what attracts our members, but it is our culture that unites us as a global organization, fosters collaboration, and helps retain members.”

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EDITOR-IN-CHIEF'S LETTER: EMBRACING CHANGE, DRIVING FORWARD

Dear INCOSE Members,

As 2024 ends, I want to thank you for your continued engagement and contributions to our vibrant INCOSE community. I also hope you are enjoying the fresh look and feel of the Membership Newsletter, a transformation that was a personal goal of mine when I assumed the role of Marketing and Communications Director over four years ago. My vision has always been to create a space that truly brings our global systems engineering community together displaying the remarkable value you, our members, deliver through chapter initiatives, working groups, and innovative projects.

This year's newsletters have been a testament to the depth and breadth of our community's impact. From industry-defining standards to transformative events, we have highlighted stories that not only celebrate your successes but also reinforce our collective mission: advancing the systems approach to make the world a better place.

2024 has been a year of milestones and collaboration as the San Diego Chapter explored the future of fusion energy through a joint event with the American Nuclear Society. The **Seattle Metro Chapter** celebrated its accomplishments in 2024 while preparing for exciting new initiatives in 2025. In Latin America, **Adrian Unger** shared advancements in formalizing the chapter, strengthening collaborations across the region, and contributing to the International Astronautical Congress. The Brazil Chapter initiated an eco-program to inspire environmental responsibility among public high school students. Collaboration was further emphasized through joint chapter events, such as the LA-SD Technical Conference, which highlighted the power of working together across regions.



Our working groups have also made significant strides. The **Materials**

Working Group highlighted why systems engineers should be invested in materials science. The **Resilient Systems Working Group** and **Digital Engineering Information Exchange Working Group** made progress in resilience and digital engineering. INCOSE's **DEI Initiative**, led by Federica Robinson-Bryant, advanced meaningful efforts to foster collective success.

INCOSE continued to enhance member benefits and services throughout the year. We are excited to launch the **INCOSE Career Center** and reintroduce the **Systems Engineering Tools Database (SETDB)**. Additionally, updates to the **SEBoK v2.11** and the **Needs and Requirements Manual** provided members with richer resources to support their work.

The future holds many opportunities in 2025 as we prepare for the coming year, I encourage you to join us at two signature events. The **International Workshop in Seville** will be a hub for innovation and collaboration. Later in the year, the **International Symposium 2025 in Ottawa** will bring together systems engineers from around the world for another inspiring gathering of minds.

Beyond these major events, I want to acknowledge the incredible efforts of our **global chapters, workshops, and regional conferences** that continuously advance systems engineering practices and make an impact in their respective regions. These gatherings highlight the diverse and united strength of the INCOSE community and are vital to our mission of fostering excellence worldwide.

A new chapter begins for me as this will be my last MarCom responsibility, as I am moving into a new role as **Head of Business Development for INCOSE**.

In this position, I will work closely with our Corporate Advisory Board (CAB) to strengthen connections and explore new avenues for growth. I am particularly excited about the opportunity to collaborate with **Courtney Wright**, who is expanding INCOSE's **Academic Equivalency Programs** globally. Together, we will help drive growth and innovation that empower systems engineers worldwide. You will be left well cared for with Kelly Henseler as she will take over the Members Newsletter and manage the marketing department going forward.

As a final close, I would like to express a heartfelt thank you. It has been a privilege to witness and share your stories through this platform. Every chapter update, working group initiative, and new service reinforces the unique and invaluable role each of you plays in our global mission. This newsletter reflects your achievements and aspirations, and I could not be prouder of the community we continue to build together.

As we close this chapter and begin another, let us keep driving forward with curiosity, collaboration, and the systems thinking mindset that defines us. Together, we will build a better world through a systems approach.

Warm regards,

Honor A. Lind

**Editor-in-Chief from 2021-2024 for
INCOSE Members Newsletter**

Head of Business Development,
INCOSE

Former Director of Marcom of INCOSE

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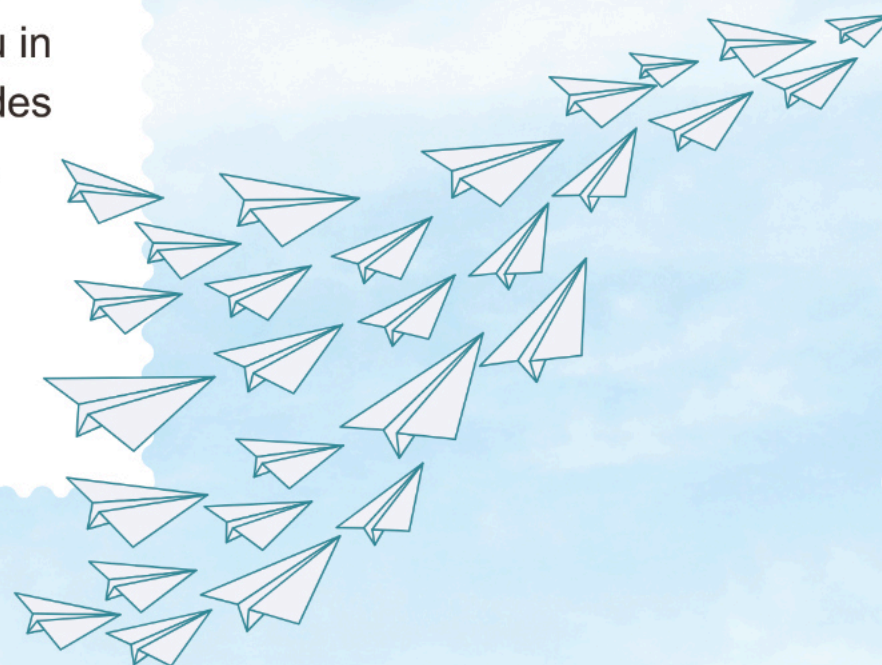
*Thank you,
Honor!*



As you step into your new role, we want to express our deepest gratitude for your incredible leadership and the impact you've made on our team and organization.

Your creativity, dedication, and ability to inspire have left an indelible mark. While we'll miss you in MarCom, we're excited to see the amazing strides you'll make as Head of Business Development.

Thank you for everything — we wish you a lot of success in your new role!



*A warm
welcome, Kelly!*

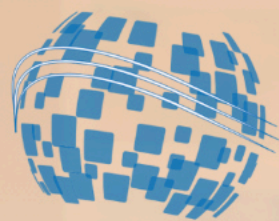


We're excited to announce that Kelly Henseler, previously our Content Marketing Manager, is stepping into the role of Marketing Manager!

Having been an integral part of the team, Kelly has already shown her creativity, dedication, and keen strategic insight. Kelly, we couldn't be more thrilled to see you take this well-deserved step forward.

Congratulations — we can't wait to see you shine as our Marketing Manager!





2025
Annual **INCOSE**
international workshop
HYBRID EVENT
Seville, SPAIN
February 1 - 4, 2025

REGISTER TODAY FOR THE INCOSE INTERNATIONAL WORKSHOP 2025!



INCOSE's International Workshop is **the event of the year** for systems engineers to contribute to the state of the art.

Unlike INCOSE's annual International Symposium and other conferences, there are no paper, panel or tutorial presentations. Instead, attendees spend 4 days working alongside fellow systems engineers who are there to **make a difference**.



All activities for the INCOSE International Workshop will take place at the **Barcelo Sevilla Renacimiento hotel** - Avenida Alvaro Alonso Barba - 41092 Seville - Spain. IW2025 will be held from **1 February 2025 until 4 February 2025**.

A limited number of guest rooms will be available for participants at a special group rate.



The International Workshop 2025 will be held as a hybrid event. It will include an **in-person experience** at the Barcelo Sevilla Renacimiento hotel and an **online experience** hosted on our virtual event platform.

IW2025 is open to **INCOSE members**, and **non-members** are encouraged to join INCOSE prior to the IW.

Shape Industry Standards


Expand Your Network

Drive Practical Solutions

Attend online or in-person

Secure Your Spot Now!

 **Seville, Spain**

 **February 1 - 4, 2025**

Chapter Updates

Click on the chapter logo to go straight to their update



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SETE 2024 – A LANDMARK EVENT MARKING 30 YEARS OF SESA AS THE AUSTRALIAN CHAPTER OF INCOSE

By Thomas Manley – SESA Technical Director / SETE Convenor and Jawahar Bhalla (JB) – SESA President

Systems Engineering Society of Australia (SESA) held its flagship event, the Systems Engineering Test & Evaluation (SETE) conference from the 22-25 September in Melbourne, Australia, around the theme “Advancing in an Emergent Digital World”. This continued a long-standing collaboration with the southern cross chapter of the International Test & Evaluation Association (ITEA), while extending a more recent partnership with Simulation Australasia Limited. The conference brought together systems professionals from across Australia, New Zealand and around the world, and in the process, set a new record for registrations (up 29% over the previous record set at SETE22). SETE24 also celebrated 30 years of SESA as the

Australian chapter of INCOSE.

For the first time, SETE extended to 3 days, preceded by a day of tutorials. Opportunities to (re)connect and network included a SESA/INCOSE catch-up on the Sunday evening, welcome drinks, and gala dinner.

Monday’s focus on Sustainability and Societal Issues saw Sam Evans (The Electric Viking) as the opening keynote, leading to a fireside chat on "Getting to Net Zero" (hosted by Thomas Manley). As each day was bookended by plenaries, Professor Bohdan "Bo" W. Oppenheim provided the afternoon keynote, speaking on SE in Healthcare, leading to a panel on "Systems and Society" (chaired by Andrew Madry).



The focus shifted to Infrastructure and Leadership on Tuesday, with Bart van Luling (INCOSE Netherlands Chapter Tech Director), and Mick Spiers (Siemens Mobility) as keynotes, and a Leadership Panel (chaired by Brett Theille). A highlight of the day was the SESA Retrospective fireside chat with several past presidents including SESA’s founder, Hervé Rochecouste (hosted by Thomas Manley) (Lower Image 7 inset – Ray Hentzschel, Stephen Cook, Kerry Lunney, Hervé Rochecouste, Roger McCowan, Thomas Manley, JB).

Finally, Wednesday was the traditional Defence day, featuring a keynote from AVM David Scheul OAM, and a panel with AVM Robert Denney AM, BRIG Damien McLachlan CSC and Bar and Simon Vaux (chaired by Marco Meloni). Lucio Tirone provided the closing keynote on the progress of the Square Kilometre Array (SKA) Observatory.

To get things off on a reflective (and almost meditative) systems start, we also had Chris Browne facilitate early-morning Systems Thinking Roundtable sessions attended by a passionate group of systems thinkers – thank you for making it in for these early sessions!

Congratulations to our amazing SETE24 MCs - Erica Barrett, Andrew Madry, Daniel Grivicic and Paul Pearce, and a huge thanks to our SETE24 Technical Chair, Chris Browne, SETE24 Convenor, Thomas Manley, my fellow SESA Executive and Committee members, Andrew Madry,



Ruben Welschen, Marco Meloni, Carly Edwards, Mikaela Stewart, Paul Pearce and Kerry Lunney, and to our SESA Branch committees for their very significant efforts that enabled possibly our best ever SETE yet.

And lastly, but by no means least, a huge thanks to the support and participation from global and regional INCOSE leaders, David Long, William Miller, Erika Palmer, Christian Sprague, Dr. Quoc Do, Mike Watson, Jessica Tucker, Nick Pickering, Thomas McKay and the NZ team, as well as our sponsors and exhibitors: Nova Systems, IBM, Lockheed Martin Australia, Project Performance International, Shoal, MEMKO, Obeo, Vitech | Spencer Tech, Mott MacDonald and ADF Careers.



JOIN A LOCAL CHAPTER

Local chapters play an essential role in the achievement of INCOSE’s goals and objectives!

[incose.org/chapters](https://www.incose.org/chapters)

JCOSE UPDATES: ONLINE SEMINARS AND JCOSE AUTOMOTIVE WG ACTIVITIES

By Midori Daida

2nd JCOSE Online Seminar: Introducing openCAESAR

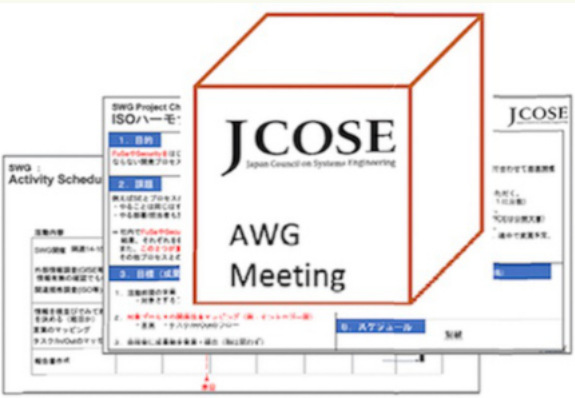
On August 24, 2024, JCOSE (INCOSE Japan Chapter) hosted its second online seminar, featuring esteemed speakers Maged Elaasar from NASA Jet Propulsion Laboratory (JPL) and Yuta Nakajima, a visiting researcher from JAXA. The seminar focused on openCAESAR, a project under NASA JPL's Integrated Model-Centric Engineering (IMCE) program.

OpenCAESAR aims to transform systems engineering into a more rigorous, agile, and data-centric process. The speakers provided an in-depth look at how the project leverages Ontological Modeling Language (OML) and semantic web technologies to enhance the precision of system descriptions. Additionally, they discussed the integration of DevOps methodologies to improve workflow agility.

Real-world applications of openCAESAR in large-scale flight projects, such as Europa Clipper, were highlighted, demonstrating the practical impact of these advanced methodologies. The seminar provided valuable insights into how openCAESAR is driving innovation in systems engineering.

3rd JCOSE Online Seminar: Exploring NASA SE Handbook and ARCADIA/CAPELLA

On October 26, 2024, JCOSE held its



third online seminar, featuring experts Remy Drouin and Thibault France. The seminar introduced participants to the NASA Systems Engineering (SE) Handbook and the ARCADIA/CAPELLA methodology. Using the Hubble Space Telescope as an example, the speakers illustrated how ARCADIA/CAPELLA can be effectively applied in MBSE practices.

JCOSE Automotive WG

On September 17, 2024, the JCOSE Automotive Working Group held its first in-person meeting in Atsugi, Kanagawa. This milestone event marked the start of active collaboration within the group, which was newly established in September.

During the meeting, participants were divided into four subgroups to discuss and plan their future activities. The lively discussions set the stage for the group's contributions to advancing systems engineering in the automotive industry.

JCOSE continues to offer platforms for sharing the latest advancements and practical knowledge in systems engineering. In March 2025, JCOSE is planning the JCOSE Systems Conference 2025, which will highlight cutting-edge developments and foster collaboration among industry experts.

INCOSE SAN DIEGO CHAPTER EXPLORES FUSION'S FUTURE

By Dr. Julia Taylor

On October 23, 2024, a very special pioneering joint event was hosted by the San Diego Chapter of INCOSE and the San Diego Chapter of the American Nuclear Society, with help organizing by Katherine Partain from the American Nuclear Society, entitled "Using Quantum Computing to Control Nuclear Fusion". The prospects of applying Systems Engineering to the process for the eventual commercialization of this technology were explored. At first, the discussion seemed a bit stuck, with engineers pointing out that they were not knowledgeable about nuclear fusion. However, as the discussion proceeded--with the help of Charley Patton from Northrup Grumman, there seemed to be a consensus that yes, it is true that the actual fusion technology is foreign, but the commercialization of it would consist of a whole lot of "pipes and steam," which is not that different from traditional utilities. The audience seemed to be warming up to the idea of applying Systems Engineering to Nuclear Fusion Power Commercialization.

We had an introductory presentation by Dr. Julia Taylor, one of the two organizers, describing nuclear fusion



and its prospects for the future. Then we heard from each of our three panelists, each with a different expertise. First, we heard from Dr. Brian Grierson, Director of the Fusion Energy Technologies Department at General Atomics, then we heard from Redentor Del Rosario, a Senior Artificial Intelligence Solutions Architect with experience in Quantum Computing, and finally, Michael DeCandia, who is a Lead Systems Engineer at G2 Ops. Our host for the evening, Dr. Mehdi Sarram, Nuclear Scientist, commented that Michael's presentation on fusion was excellent. Then finally, Dr. Julia Taylor gave a brief presentation on the application of Systems Engineering to Nuclear Fusion.

The audience was so excited about the topic that they started asking questions even before the formal questions were brought before the panel! That's what you like to see in an audience-- great participation. Lots of questions were presented, and there were lots of spirited discussions. The room was full, and we had a great response to the event.



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The idea of inexpensive power that does not produce very much waste is a very appealing notion. That's what nuclear fusion promises us. However, the big problem is that it simply has not been created and controlled here on Earth in a sustainable manner. It's still kind of exploratory and experimental. Although it happens on the sun continually, it's not so easy down here. We want it here on earth, but in a way in which it benefits us and does not harm us. The good news is that there are many budding technologies in the works now that may contribute to its future. Quantum Computing is one of them.

My hopes were a bit dashed, though, when I heard Dr. Grierson say that because Quantum Computing is not really reliable yet, it cannot be used for nuclear fusion in real time to control various aspects of it. It can be used to help come up with new models for how to control it and for many areas, but not real time control. That's where I think it would have the biggest impact-- if it was feasible.

However, all is not lost. The field is simply expanding exponentially right now so that the possibilities are greater than ever before. New technologies such as AI, ML, Quantum Computing, Advances in new materials, 3-D Printing, Chip Making Advances, & Robotics are allowing for capabilities that were only dreamed about in the past. These new capabilities may make way for fusion technology advances that are so dramatic that it's impossible to

even imagine them.

For example, AI has been used to boost fusion reactor efficiency. Advances in computational power lead to faster design cycles, greater plasma stability, and better reactor designs. In order to come up with an optimum fusion machine design, it might take considering 10 billion configurations. Although computer speed is much faster-- what would have taken months



a decade ago, takes only hours now, still that is not fast enough. That's why using AI may open the door for answers based on models that can come about fast enough to provide a workable solution.

Key researcher Cowley, cited in a recent IEEE Spectrum article, says that the biggest hurdles for magnetic-confinement fusion involve developing materials that can withstand extreme conditions, managing heat and power efficiently, advancing magnet technology even more, and integrating all these components into a functional and scalable reactor.

Progress on developing new materials was just reported on November 8, 2024, that came from work in an experimental fusion reactor at Marvel Laboratory in San Diego, CA. They worked through a sorting process using a large database and identified suitable candidates. This led to 71 prospects. By researching the properties of each of these, the list was further sorted to 21 prospects which

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include tungsten metallic (W), and carbide forms (WC & W2C), diamond & graphite, boron nitride, molybdenum, tantalum, & rhenium. Who knows, maybe one or more of these new prospects might turn out to be the key material that can contain the plasma on a sustainable basis?

Could Zap Fusion be on to something in terms of "Managing heat and power efficiently"? Maybe. On November 9,



2024, the company unveiled a revolutionary reactor design for a nuclear power plant that does not use a magnet. It is designed to fire high-voltage pulses of power every 10 seconds for more than 2 hours. In a way, it's kind of like an internal combustion engine because it has cylinders that fire all day long in order to produce a steady energy output. Zap employs a technique called "sheared flow stabilization" which can extend the life of the plasma that is produced almost indefinitely, allowing it to continue to generate energy for as long as is needed.

Most fusion energy designs use magnetism. Magnet technology has advanced substantially in recent years.

In 2021, the most powerful magnet ever created on Earth was announced. It turns out this was the first magnet with enough power capable of containing a fast-moving plasma field with heat in excess of 150 million degrees Celsius without touching & melting the containment barrier.



High heat is needed for a fusion reaction. On November 5, 2024, yet another breakthrough in fusion technology happened. Quantum Kinetics Corporation succeeded in sustaining 200 million degrees Celsius for 24 hours. Then, on November 10, 2024, the company succeeded in reaching 392 million degrees Fahrenheit for 24 hours. This greatly surpassed another company's 105 million record that was achieved before this.

Finally, integrating all of the crucial components into a functional and scalable reactor depends on the skill of engineers, in particular, Systems Engineers. This is truly exciting indeed. Events such as ours on October 23 help to spark interdisciplinary discussion and open the door to innovative thinking, which is the key to turning "what appears to be impossible"-- into "the possible" right here on earth.



INCOSE SEATTLE METRO CHAPTER UPDATE

Chapter 2024 President's Letter

Dear INCOSE Community,

Our Chapter has been buzzing with activity, and I'm thrilled to report that we've hosted some truly impactful monthly meetings with leading experts in the field. During the second half of the year, we've explored a range of cutting-edge topics that are shaping the future of our industry, including Dealing with Emergence in Model-Based Engineering, Architecture Optimization for Sustainability, and the Lifecycle Roles of AI in Systems of Systems. These discussions sparked insightful conversations, and I'm grateful for the active participation of all those who attended. It was also great to once again have in-person meetings (with pizza!) while discussing systems engineering.

In addition to our regular meetings, I had the privilege of representing our Chapter at the 7th Annual INCOSE Western State Regional Conference in Albuquerque, NM. This was a fantastic opportunity for networking, learning, and sharing knowledge with peers across the region. The exchange of ideas and experiences truly highlighted the strength of our community, and we look forward to building on those connections in the coming months. I am also happy to announce that in 2025 the 8th Annual Western State Regional Conference is coming to Seattle. I'm looking forward to the Seattle Metro Chapter hosting this incredible annual event next year!

Looking ahead, we're excited to continue providing valuable content and opportunities for professional growth. I



encourage all of you to stay involved, attend our upcoming events, and share your thoughts and feedback to help guide our future programming.

Finally, I want to extend my sincere thanks to all of our volunteers, speakers, and participants for their continued dedication to our chapter's success. It's your enthusiasm and commitment that make everything we do possible.

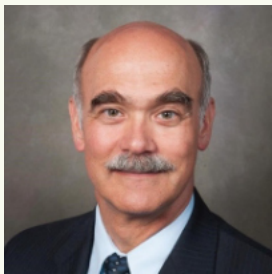
Here's to a successful and inspiring year ahead!

Warm regards,

Kyle Zienin
INCOSE Seattle Metro Chapter
President

2024 Highlights: Year in Review

2024 was surely an exciting and impactful year for our INCOSE chapter. We expanded our working groups to cover all aspects of



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systems engineering across various industries, from traditional sectors to emerging fields like medical systems. One of our goals was to ensure comprehensive inclusivity and address the diverse challenges in engineering today.

During Engineer's Week each year, the Puget Sound Engineering Council (PSEC) conducts an Awards Banquet to celebrate our engineering profession – a rewarding profession that makes the world a better place; and to recognize our colleagues who have excelled in their achievements. This year, the Awards Banquet was held on May 4, 2024, at Seattle's Museum of Flight. The INCOSE Seattle Metro Chapter proudly nominated one of our own INCOSE ESEPs, Dr. Ron Carson, for Industry Engineer of the Year 2024, and he received the award from the council. Several members of our Chapter attended the event to witness his achievements.



We also brought back in-person meetings this year held monthly at Cascadia Pizza in Bellevue, WA. While the presentations to the Seattle Chapter are always wonderful, the topics this year were as compelling as ever to showcase the breadth and depth of systems engineering. Here are a few of the topics by featured speakers who presented to the Chapter this year.

- Systems Thinking for Change, Erika Palmer

- Dealing with Emergence in Model-Based Engineering, Steve Holt
- Architecture Optimization for Sustainability, Dr. Haifeng Zhu
- Lifecycle Roles of AI in Systems of Systems, John Palmer

Recapping 2024 and Looking Ahead to 2025: Moving Forward Together

As we recap 2024 and step into 2025, we reflect on the exciting updates and events that have shaped our community this year. From insightful presentations on INCOSE's offerings by Alexandra Kowalski to engaging discussions on innovative Model-Based Systems Engineering (MBSE) approaches by Mark Williams, we've had an abundance of valuable content to share. We've also celebrated the achievements of exceptional engineers at the Puget Sound Engineering Council (PSEC) Awards Banquet and extended invitations for members to join our monthly Seattle Chapter meetings to

network and stay updated on the latest developments. As we look ahead, we encourage you to stay tuned and bring your ideas forward—whether it's feedback, suggestions, or topics you'd like to see featured. Together, let's continue to build a vibrant, supportive community of systems engineering professionals in 2025.

UNIQUE INCOSE-LA YOUNG PROFESSIONALS (YP) EVENT

By Fred Lawler

The latest Innovative Resume Workshop was held, in conjunction with the recently established INCOSE-LMU Student Chapter, at LMU's College of Engineering's Main Lecture Hall on Friday, October 18, 2024. The multi-faceted purpose of this event was to:

- Encourage more LMU Chapter Student Participation (including recruiting Future Officers)
- Prove how Valuable (& Important) Systems Engineering has become in our Complex World
- Promote our Active (almost 500 Members strong!) INCOSE-LA Chapter, including citing our many

upcoming Chapter Events (eg, Speaker Dinner Talks, Hands-On Tutorials, STEM Outreach, etc)

- Encourage these near-graduates to Thrive (& Focus) in their Remaining Studies
- To suggest (including a Trendy Example!) of an Innovative Resume format & content
- To complement (& add many Current Industry Insights to) ongoing LMU Career Services Insights

This Special Event was Free & included a buffet dinner provided by the hosting INCOSE-LA Chapter. Several previous such on-campus workshops were held

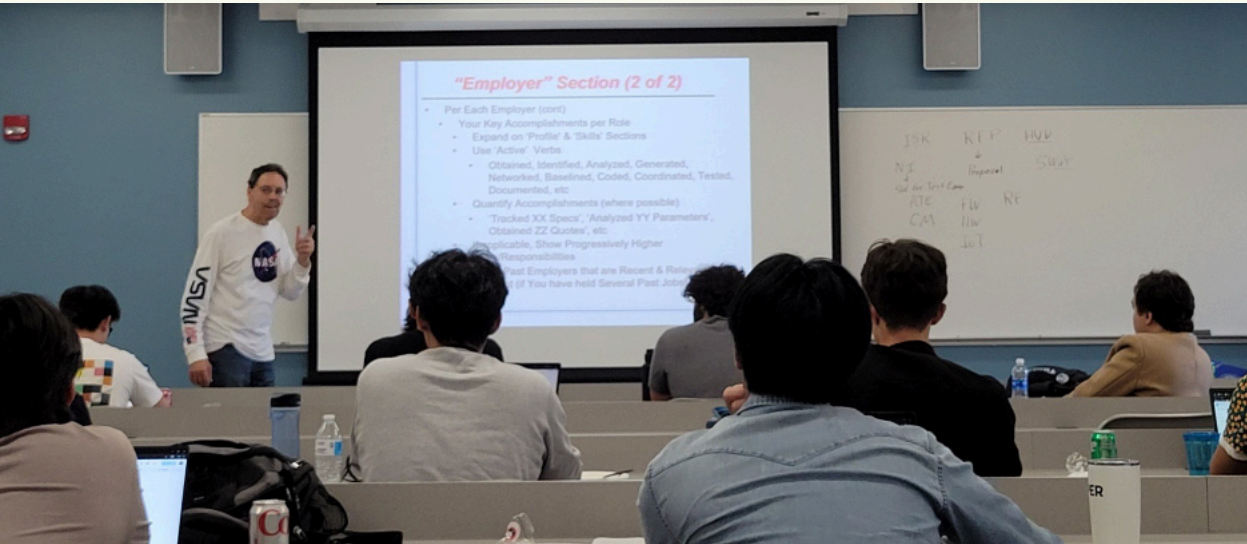


(& also well-received) at UCI, CSULB & CSULA.

More are being planned as possible catalysts for forming more INCOSE College Student Chapters. These events have been formulated, coordinated & conducted by Fred Lawler, the 2024 INCOSE-LA Chapter's Vice-President, who is also their STEM

& YP Outreach Coordinator and Promoter.

(Note: These Events also qualify as Chapter Circle Award Category #E1 (Recruiting Members Event).)



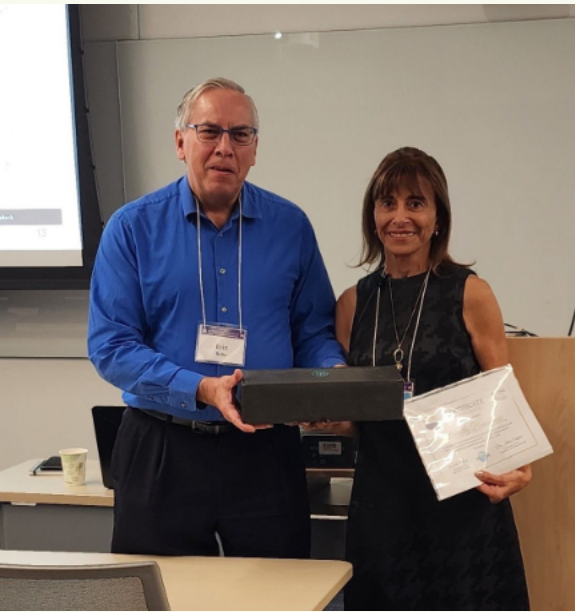
JOINT TECHNICAL CONFERENCE WITH LA-SD CHAPTERS: “INDUSTRY APPLICATIONS OF SYSTEMS ENGINEERING AND SYSTEMS APPROACHES” NOVEMBER 9-10, 2024

By Dr. Julia Taylor

This conference was held this past weekend on the UC Irvine campus in a beautiful, scenic setting with very professional meeting rooms. The conference was kicked off with Dr. James Melton giving a Keynote, “Why Mars, Why Now?”. This sparked our imaginations and got us to start thinking about what it really would take to get to Mars. An exciting prospect.

We had three different tracks for both days of the conference. There were a lot of brand-new presentations, which were very informative. I was very happy to see that there were a fair amount of presentations on MBSE, an upcoming area of Systems Engineering, as well as quite a few talks that included components of AI (artificial intelligence). We all need to get prepared for the future by immersing ourselves in these new subject areas.

We also had a number of talks that were more related to classical Systems Engineering regarding big topics like “Requirements,” “Software,” and “Cybersecurity.” We had tutorials to help boost Systems Engineering skills and talks about improving your interpersonal skills and communication skills. We had some talks about academic competencies and Systems Engineering competencies. Some talks applied the Systems Approach to new areas outside of defense and aerospace, such as problem-solving in business organizations and the process of



lawmaking. There were talks on how to maintain resilience at Boeing, for instance, and all about the transformation process toward MBSE, which is taking place at NASA.

Our keynote speech on Sunday by Mike Wallace from Virgin Galactic was very energetic and motivational about applying new Systems Engineering concepts in practice. Everyone that I spoke to seemed to be quite happy with the content of the conference, the learning opportunities, and the fellowship of connecting with both people you know and people you just met.

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We had very nice food that was catered. I was especially happy with the mid-day treats on both Saturday and Sunday. Those little bonuses make a big difference in your experience, especially when you are trying to stay focused on such high-quality materials being presented. You don't want to miss out on anything.

Certificates and gifts (a tech related gadget) were given to the presenters as a way of saying thank you. In addition, there were a few special awards. Dr.

Julia Taylor, President of the San Diego Chapter, gave awards to John Thomas and Greg Bulla for service above and beyond for the San Diego Chapter. John Thomas also received a special award for kindness and cooperation for his work with the San Diego Chapter. Dr. Rick Hefner received a special present honoring him for going above and beyond with all his work putting on the





joint conference.

The Chairs of the Conference Committee were Dr. Rick Hefner, representing Los Angeles, and Dr. Julia Taylor, representing San Diego. Nazanin Sharifi and Victoria Patterson, also on the Conference Committee, worked tirelessly all during the conference as well as during the many weeks prior to

the event. Greg Bulla also worked very hard with technical issues, and he was able to overcome some big hurdles for us. There were also others who worked behind the scenes to make this happen.

My hope is that we learn from this experience and do another joint event for 2025 that is even better! If you missed it, you definitely will not want to miss it next year!!



2024 WSRC: BUILDING A MORE SECURE WORLD THROUGH SYSTEMS ENGINEERING

The 2024 INCOSE Western States Regional Conference (WSRC) in Albuquerque, New Mexico, brought together Systems Engineering professionals from 23 U.S. states and five countries, solidifying WSRC as a premier gathering for knowledge-sharing and innovation in the field. With 131 in-person participants and 16 virtual attendees, the conference surpassed pre-pandemic attendance, underscoring its growing role in addressing today's complex challenges through Systems Engineering.



Michael Watson giving his keynote speech on INCOSE's strategic plan

Each day began with insightful keynotes from leaders defining the future of Systems Engineering. Opening the conference was Michael D. Watson, INCOSE President-Elect and Systems Engineering Director for Leidos Defense Systems Sector, who shared INCOSE's strategic vision and emphasized the expanding role of Systems Engineering in tackling global challenges. James Owen from Los Alamos National

Laboratory (LANL) followed, highlighting the field's significance in nuclear security and presenting digital solutions for managing nuclear weapons research. On the second day, Mark Myshatyn, Enterprise AI Architect at LANL, discussed the potential of artificial intelligence in national security, emphasizing AI's role in enhancing resilience. The keynote series concluded with David Stracuzzi from Sandia National Laboratories, who explored the ethical and reliability challenges of AI in high-stakes applications and underscored the need for certification in AI systems. Together, these speakers highlighted how Systems Engineering, AI, and national security converge to address today's critical challenges.



One of the 7 tutorials offered during the conference

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Weber State's System Engineering program is excited to partner with the 27th Street Trail Project, to elevate community engagement with nature and local history. We're developing themed and accessible interpretive trail signs that cover local flora and fauna, geology, and historical insights, including the local hotel and the Lowe Brothers' climbing history. Our goal is to offer a comprehensive view of the ecosystem, illustrating the dynamic interplay between natural and human systems. These signs will seamlessly blend with the trail environment, enriching the visitor experience and deepening their understanding of the intricate connections between nature, history, and human activities.

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This year’s program covered vital topics, from Model-Based Systems Engineering (MBSE) and digital engineering to AI integration and human-systems interaction. Sessions demonstrated MBSE techniques, digital engineering tools, and frameworks like SysML and digital twins, essential for creating accurate, integrated models in complex projects. Other sessions focused on safety and resilience, including cybersecurity, risk management, and human-systems integration—key areas where Systems Engineering plays a critical role in maintaining security and reliability.



Dassault Systèmes booth in the vendor area

The success of the 2024 WSRC was made possible by the commitment of our volunteers, speakers, and sponsors. We extend special thanks to our sponsors, including BAE Systems, Dassault Systèmes, Los Alamos National Laboratory, Sparx Services, Armstrong Process Group, Caltech, Northrop Grumman, Obeo, Weber State University, Studio SE, Aerospace Corporation, University of Texas at El

Paso, and Colorado State University, whose support enabled this impactful program.



Volunteers preparing WSRC 2024 conference tote bags

Building on this year’s success, we are thrilled to announce that the 2025 WSRC will be held in Seattle, Washington. We look forward to welcoming you to Seattle, where we’ll continue to explore emerging trends and opportunities in Systems Engineering. Thank you to everyone who participated in WSRC 2024. Let’s keep driving progress and innovation to build a more secure and resilient world through Systems Engineering!

INCOSE LATIN AMERICA (LATAM) UPDATE

By Adrian Unger

As we conclude the fourth quarter of 2024, we are excited to share the significant progress our chapter has made in advancing systems engineering across the region.

Participation in the Concurrent Design Facility Demo at the International Astronautical Congress

In November, our chapter actively participated in the International Astronautical Congress held in Salta, Argentina. One of the event's highlights was the Concurrent Design Facility (CDF) demonstration, led by Massimo Bandecchi retired from the European Space Agency’s (ESA) ESTEC Institute. This session offered invaluable insights into collaborative design methodologies, highlighting the critical role of integrated systems engineering approaches in aerospace projects. We participated

together with well-known aerospace companies and institutions such as VENG, INVAP, CONAE, ARSAT, AEB, Reflex, ReOrbit, and others.

Strengthening Collaborations with Colombia and Peru

We have achieved notable advancements in strengthening relationships with academic institutions in Colombia and Peru. These collaborations aim to foster knowledge exchange, support joint research initiatives, and promote systems engineering education within these countries.

Advancements in Chapter Formalization

Our efforts to formalize the INCOSE Latin America Chapter continue to gain momentum. This quarter, we have been



diligently preparing the necessary documentation to achieve official recognition. This milestone will enhance our ability to serve and support the systems engineering community across Latin America effectively.

Translation of the INCOSE Systems Engineering Handbook Version 5

In collaboration with the INCOSE Spanish Chapter, we are making steady progress in translating the INCOSE Systems Engineering Handbook Version 5 into Spanish. This initiative is pivotal in

making systems engineering knowledge more accessible to Spanish-speaking professionals and students, promoting the discipline's growth and adoption throughout the region.



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INCOSE BRASIL SUPPORTS PROJECT INSPIRING SUSTAINABILITY AND SYSTEMS THINKING IN EDUCATION

By Bruno Soares do Livramento

INCOSE Brasil has joined forces with “Eco Team for a Better World”, an initiative to foster environmental responsibility and sustainable practices among high-school students from the public education system in Brazil. The Eco Team initiative was launched on September 10th in Sorocaba (Sao Paulo state) at an event attended by the U.S. Consul General in Sao Paulo, industry experts, and academia. The event also featured a recorded message from INCOSE Brasil President Fabio Silva, emphasizing the organization’s commitment to educational programs integrating systems engineering principles with environmental stewardship.

Through this collaboration, INCOSE Brasil is providing critical resources and expertise. Members of the organization, including Raquel Hoffmann, Natalia Rocha, Guilherme Pimentel, and Adail Retamal, are mentoring Eco Team participants, guiding them through systems engineering concepts applied to real-world environmental challenges. The chapter’s Infrastructure Director, Adail Retamal, an experienced systems thinker, also led a dedicated class on systems thinking, encouraging young participants to approach problems holistically.

INCOSE Brasil’s contributions extend to the Eco Team’s competitive activities,

with Rogerio Machado from INCOSE joining the judging panel to evaluate student projects that reflect innovative and sustainable solutions. By supporting the Eco Team for a Better World, INCOSE Brasil reinforces its dedication to educating future generations on sustainable practices through systems thinking, positioning them to contribute positively to Brazil’s environmental landscape.

INCOSE Brasil at UFMG’s Systems Engineering Week

INCOSE Brasil was invited to give a talk to systems engineering undergraduate students at the Federal University of Minas Gerais (UFMG) during the Systems Engineering Week. Marcia Platilha, who is currently responsible for academic relations at INCOSE Brasil, was assigned to this mission. In her presentation, she addressed the future and challenges of systems engineering in line with INCOSE’s vision 2035. Marcia emphasized the importance of adaptability and continuous learning, highlighting how essential it is to master and adhere to the fundamental principles of systems engineering. In an era where technological advancements occur at an unprecedented pace and a vast array of tools and methodologies are available, understanding and applying these core principles becomes vital to navigating the complexities of the



field. In her talk, she also addressed the challenge of effectively combining engineering knowledge with emerging technologies to develop innovative solutions capable of addressing complex problems.

The Third Season of Systems Talk Podcast by INCOSE Brasil

In October 2024, INCOSE Brasil concluded the third season of *Systems Talk*, the chapter's official podcast. This initiative aims to share the experiences and knowledge of Brazilian professionals and experts in Systems Engineering and Systems Thinking, addressing relevant topics with a blend of technical depth and accessible language.

The season began with an episode on System Lifecycle Management, presented by Rogério Comello Machado. Amanda Santana, Brazil's first Systems Engineering graduate, followed with reflections on pioneering and innovation. Heraldio Makrakis discussed the use of war games as a tool for Systems Engineering, while Gilval Mendes presented a systems approach to Workplace Safety. Danilo Miranda explored topics related to Space Engineering and the Defense Sector, and Yasmin Medeiros delved into

Systems Innovation (Si) and a systemic view of psychology. Education was also on the agenda with Ana Liddy Magalhães, who discussed Systems Engineering education in Brazil. Additionally, Alexandre Magno and Manoel Pimentel participated in an episode on the Cynefin framework.

A special episode was dedicated to the book *Thinking in Systems* by Donella H. Meadows, featuring analyses and discussions led by Adail Retamal and Eduardo Pasinato. Closing the season, Raquel Radoman, Arthur Hendricks, and Lilian Honorato shared their experiences at the 34th Annual INCOSE International Symposium.

Systems Talk is available on YouTube, Spotify, and Apple Podcasts and has established itself as an essential tool for promoting engagement and disseminating the principles of Systems Engineering in Brazil. The third season was hosted by Bruno Soares, INCOSE Brasil's Director of Communications, with support from Vice President Diego Rangel and Communications Directorate volunteers Ricardo Suguita and Gabriel Mendes. With diverse episodes and relevant content, *Systems Talk* reinforces INCOSE Brasil's commitment to contributing to the global Systems Engineering community.

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ROCKET CITY INCOSE STUDENT DIVISION HITS THE GROUND RUNNING IN FALL 2024

By Tony Lindeman, INCOSE-HRC President

The Rocket City INCOSE Student Division at the University of Alabama in Huntsville (UAH) kicked off its 2024 fall semester by participating in a table event that welcomed and provided new students with an opportunity to learn more about an assortment of campus life activities. They were able to talk with about 25 students and were able to sign on 13 students to their GroupMe Campus chat group.

On August 27, 2024, the Rocket City INCOSE Student Division hosted a resume writing workshop. Eleven students were provided guidance on the basics of resume writing and given a few more tips on how to go about preparing a standout resume. Two UAH professors from UAH's Industrial and Systems Engineering (I&SE) Department met individually with the



students to provide additional suggestions that would help them to successfully land systems engineering summer internships and co-op employment opportunities.

Tony Lindeman, ESEP; INCOSE – Huntsville Regional Chapter (HRC) President, later spoke at their kickoff meeting on Wednesday, September 11, 2024. Tony provided the attendees with



an overview of INCOSE, INCOSE's Systems Engineering Vision 2035, and his personal perspective on the extraordinary growth in the systems engineering workforce within the Huntsville and Tennessee Valley region.

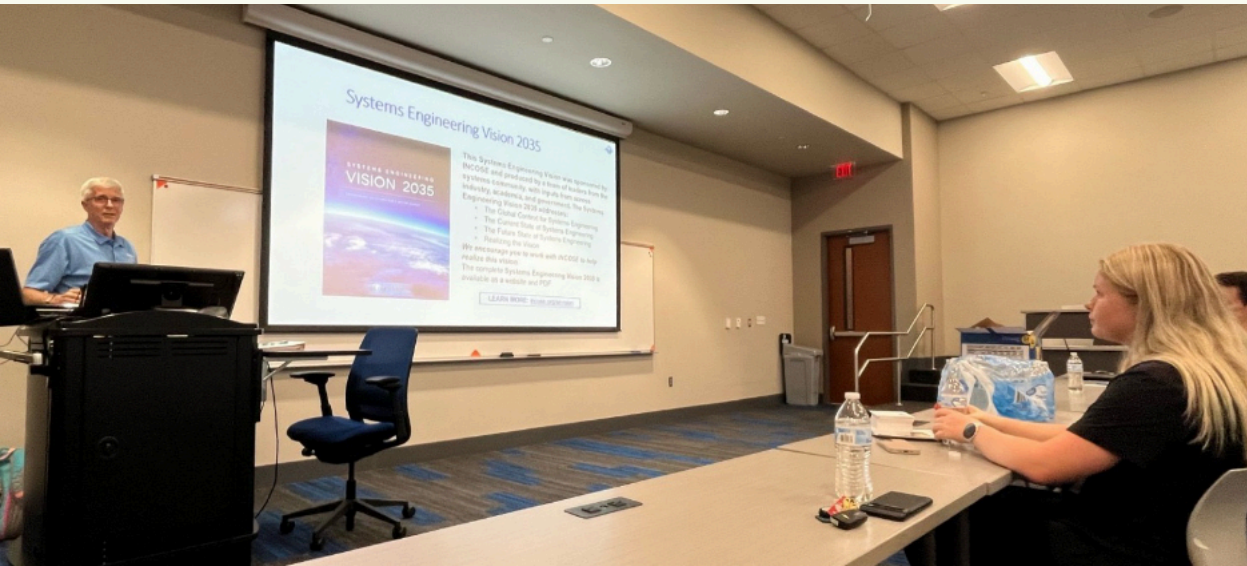
Kelly Campo, ASEP, said, "My term as the Rocket City INCOSE Student Division President has really turned out to be a lot of fun and very rewarding. I, along with my friends, have been able to learn more about systems engineering career options and associated employment opportunities during the course of our studies here at UAH. We have a close working relationship with the INCOSE – Huntsville Regional Chapter (HRC), who have been instrumental in providing support and access to numerous SE professionals from across the local business community."

The Rocket City INCOSE Student Division has been active since 2022. UAH is a member of the INCOSE Academic Council and currently maintains a roster of 125 INCOSE student associates. UAH's INCOSE Systems Engineering Professional



(SEP) academic equivalency program is reporting 10 active students who have been able to earn their INCOSE ASEP certification prior to their graduation.

Additional information about the Rocket City INCOSE Student Division can be found at: <https://rcincose.uah.edu/>





INCOSE NEW ENGLAND CHAPTER UPDATE

By Bill Luk

On 21 October, from 10 am-2:30 pm, Dassault Systèmes, the developers of Cameo, graciously hosted the INCOSE New England Chapter at its North American headquarters in Waltham, MA, where we learned the power of the 3DEXPERIENCE platform in action. The workshop was entitled “Systems Engineering Access Across the Life Cycle: Beyond SySMI.”

The meeting was attended by experts from Dassault and INCOSE members from Draper Laboratories, Boston Metal, Elbit Systems America, CYTIVA, USAF Hanscom AFB, and BAE SYSTEMS.

MBSE is critical to the development of modern systems. However, many systems engineers experience the challenge of conveying all the important information downstream to other disciplines while ensuring full traceability from their model, through requirements,

down to the individual components managed by others.

This on-site workshop demonstrated extending the capabilities of No Magic Cameo (aka CATIA Magic) beyond systems modeling by leveraging the power of the 3DEXPERIENCE platform.

The demonstration was followed by a complimentary networking lunch and networking. Some of the more detailed topics were requirements traceability, requirements validation, how to link objects, and how the various tools in the 3DS suite interact to provide a DEE environment.

Dassault is a corporate Advisory Member of INCOSE.

[INCOSE New England Chapter](#)'s next event is a workshop on AI at WPI on 21 November.

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INCOSE CANADA CHAPTER UPDATE

Message from the Chapter's President in 2025

As we enter the fourth quarter of the year, I am excited to reflect on the progress INCOSE Canada has made towards achieving our vision. Our Strategic Plan outlines our goal to become the key enabler for the Systems Engineering community in Canada to network, collaborate, share ideas and experiences, and disseminate Systems Engineering knowledge and best practices. In Q2 2024, we took a significant step towards realizing this vision by hosting our first in-person events in Vancouver and Toronto since the pandemic. These gatherings were a resounding success, and we are thrilled to announce that we have successfully hosted the second round of in-person events in Vancouver and Toronto. Our Technical Program continues to deliver exceptional value to our members, featuring expert speakers and rising stars in the Systems Engineering domain. We also recently wrapped up a highly successful member-led INCOSE SE Handbook study group, demonstrating our commitment to knowledge sharing and dissemination.

In addition to our in-person events, we have successfully welcomed new volunteers to our board after our election in November, where our members had the opportunity to vote for 2025 board members. We are excited to welcome new talent and



experienced veterans to our team, and thank you for your continued support and engagement with INCOSE Canada. We are committed to delivering value to our members and advancing the practice of Systems Engineering in Canada.

Welcome to Our Newest Members!

We are excited to welcome our newest INCOSE members to the Canada Chapter. Please look for them at future events. The following members joined in Q4 2024:

- Alberta** Dipo Omotoso, Afridee Islam Alif
- British Columbia** Magali Desemery, Jiyeong Jeong
- Nova Scotia** Brad MacQuarrie
- Ontario** Ananya Mishra, Harita Patel, Andrea Goldman
- Quebec** Kouessan Kangni, Vijaykamesh Balakrishnan
- Other** Brent Figg

Congratulations to Our Q4 2024 Systems Engineering Professionals!



Johannes van der merwe

Many individuals participated in the INCOSE Canada chapter's study group in **2023 and 2024**, in which systems engineers studied the INCOSE Systems

Engineering Handbook in 12 weeks and prepared for the INCOSE Certification Exam. If there is enough interest, we will look to start additional study groups in **2025** for those interested in pursuing either ASEP or CSEP certification. Please email us at canada@incose.net if you are interested.

Canada Chapter Q1 events

Jan 22nd - Strategic Insights: INCOSE Canada's 2023 Retrospective and Vision for 2024 ([Event Recording Link](#))

Feb 11th - Leveraging AI in Systems Engineering ([Event Recording Link](#))

Canada Chapter Q2 events

April 29th - Needs, Requirements, Verification, and Validation Management (NRVVM) ([Event Recording Link](#))

May 9th – In-person meet-up in Vancouver, BC

May 17th – In-person event in Toronto, ON

June 10th - Increasing the Success Rate of AI and ML Systems Deployment at the Enterprise Level ([Event Recording Link](#))

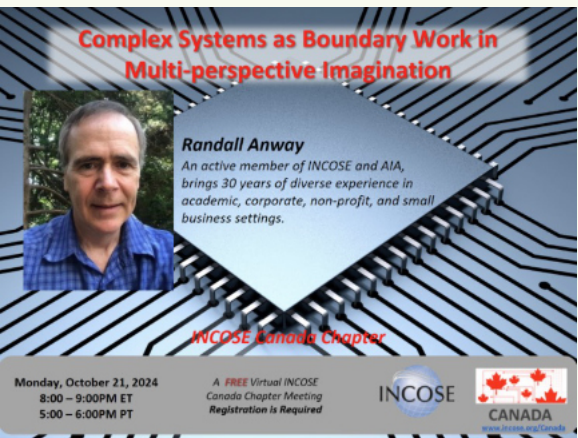
Canada Chapter Q3 events

July 29th - Happy Hour Event: Sharing Experiences from INCOSE IS2024

Canada Chapter Q4 events

October 21st - Complex Systems as Boundary Work in Multi-perspective Imagination ([Event Recording Link](#))

This was an INCOSE virtual event featuring speaker Randall Anway, an active member



of the International Council on Systems Engineering and the American Institute of Architects.

October 30th – Second In-person meet-up in Vancouver, BC

After successfully hosting one of the first in-person INCOSE Canada Chapter meetings in Vancouver, we successfully hosted the second in-person meet-up in Downtown Vancouver in **Q4 2024**. It was fantastic to reconnect with systems engineers from various domains, all passionate about advancing systems engineering practices. Special gratitude goes to our guest speaker, William Hui, Director of Systems Engineering from TransLink, for sharing his perspectives on the values and challenges we face in the field of systems engineering in

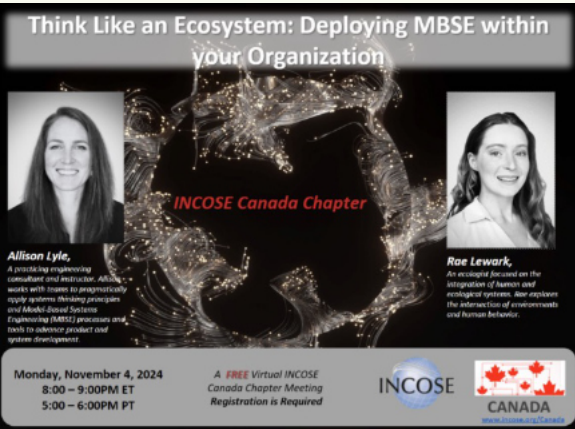




capital projects. Thank you to everybody who contributed and joined to make this in-person event a success.

November 4th – Think Like an Ecosystem: Deploying MBSE within your Organization (Event Recording Link)

This was an INCOSE virtual event presenting how natural ecosystems can provide insights into managing change in human and engineered systems. By applying principles of ecosystem succession to MBSE deployment, organizations can improve and accelerate new initiatives. The authors



propose a bio-inspired design process that draws on nature’s strategies to

develop resilient processes and efficient modeling practices.

November 23rd – Second In-person meet-up in Toronto, ON

After successfully hosting one of the first in-person INCOSE Canada Chapter meetings in Toronto, ON, we hosted the second in-person meet-up in North York, Toronto in a hybrid format on Saturday, Nov 23rd, 2024, 1:30 EST. In this event, we had a brief welcome note by a representative from INCOSE Canada, highlighting the purpose and goals of the event, and a presentation on Integrating System Dynamics and SysML by our guest speaker Ivan Taylor, president at Policy Dynamics Inc and continued the event with an hour of casual networking session among systems engineering professionals in the Lower Mainland area.



December 2nd - Why Systems Engineering is a Smart Investment: Managing Complexity, Reducing Risk, Saving Money

This INCOSE virtual event, hosted by the INCOSE Canada Chapter, featured speaker Ivan Taylor, president of Policy Dynamics Inc.

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If you are interested in presenting at one of the Canada Chapter’s events, please reach out to canada@incose.net. Different Systems Engineering topics are welcomed, including Requirements Management, Model-Based Systems Engineering (MBSE), Verification and Validation, Machine Learning/AI, Cyber Security, and Systems Safety/FMEA. **Presenters get a certification from the INCOSE Canada Chapter for their contribution to the chapter.**

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NORSEC NORWAY CHAPTER UPDATES FALL 2024

Systems Engineering Study Group (SESG) on 21st Nov.

NORSEC in collaboration with University of South-Eastern Norway (USN) has been regularly holding Systems Engineering Study Group (SESG) events at the University of South-Eastern Norway, Kongsberg, Norway. The objective of the meetings is to exchange experience between people who are interested in systems engineering or who have the intent to become a systems engineer. The SESG discusses one theme per meeting.

SESG theme for Fall 2024 : **Ecosystems from customer to supply network**

In connection with SESG NORSEC arranged a paper-based INCOSE certification Knowledge Exam for its members on 20th Nov. This is the first time NORSEC arranged this exam in Norway. Satya Kokkula CSEP, Chapter President of NORSEC proctored the exam. Six enthusiastic Systems Engineers took the exam. (Look forward for more SEP's from NORSEC).

SESG session started @14:00 with forty plus Systems Engineers @USN Kongsberg. Three speakers for the evening were:

1. Lasse Sletaker, AkerBP
2. Erika Palmer, INCOSE
3. Marianne Kjørstad, Kongsberg Maritime

After the three presentations there was a networking break for 30 minutes.



Fig. 1 Marianne Kjørstad from Kongsberg Maritime presenting on SoS Ecosystem for Maritime operations



Fig. 2 Erika Palmer presenting on Social Technical system perspective in Ecosystem layers.



Fig. 3 Lasse Sletaker presenting on Ecosystem layers for the oil and gas sector, challenges and opportunities.



Fig. 4 SESG Fall 2024 participants

Before fetching tea/ coffee and/or gingerbread (Christmas cookies) we gathered for a group photo.

After the break we gathered again for the workshop session. During the break Prof. Gerrit Muller, INCOSE Fellow, came with the following questions

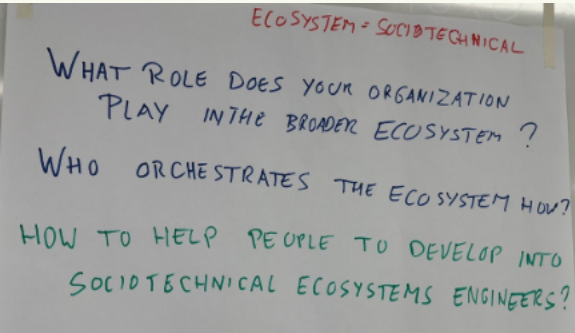


Fig. 5 Questions for workshop activity.

We divided the participants into 10 teams to work on the above questions and present the results in a plenary session before closing the session.

We are happy with the number of participants, with great discussions and engagement during the workshop and

presentations.

We closed the SESG session at 17:00 in the evening. On the same evening USN Systems Engineering group arranged a “Jul” gathering (Christmas party) for their students, alumni, teachers, and network partners.

We are glad for the feedback as participants say “well spent valuable time”.

Photo credit: Satya Kokkula.





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NORDIC SE TOUR IN OSLO

Thirty-five people joined the Nordic Systems Engineering (NoSE) tour in Oslo on 18 September 2024. The event is organized by the INCOSE Norway Chapter (NORSEC) as part of the autumn tour. Satya Kokkula CSEP and Chapter President, opened the day with a warm welcome and a brief overview of the INCOSE Vision 2035. He also stressed that achieving these objectives requires networking and sharing knowledge, such as we do during the NoSE Tour.

This year's rotating speakers spoke on leadership (Stephen Hirshorn), defense acquisition (Jakob Carlén), SE for sustainability (Sarath M. Salim), and the latest changes in the INCOSE product development process (Christian Sprague). Local speakers covered

Transformation in the age of AI & big data (Dr. Karen Czachorowski) and MBE for Robotic Assembly (Dr. Shafi K. Mohammed). The program for the entire three-day tour can be found on the [Nordic Systems Engineering Tour webpage](#).

Participants this year included five NORSEC presidents, members, students, and professionals interested in systems engineering. The next event in Norway is our biannual Systems Engineering Study Group (SESG) on 21 November. The SESG will be preceded by an INCOSE certification paper exam on 20 November.

The photos attached are of visiting speakers and NORSEC presidents.



Photo credit: Kirsten Helle.

Photo 1: (l to r) Christian Sprague, Jakob C, Stephen Hirshorn and Sarath M. Salim.



Photo credit: Jakob Carlén.

Photo 2: (l to r) Satya Kokkula, Todd Wohling, Kirsten Helle, Terje Fossnes and Cecilia Haskins.

INCOSE UK UPDATES

1. INCOSE UK Council Changes

We are pleased to announce that Andrew Pemberton is now President of INCOSE UK. We wish him every success in the role.

Malcolm Thomas now takes a step back from the presidential role and takes on the position of Immediate Past President. We would like to thank Malcolm for his time and the contributions he has made as President.

We welcome Hazel Woodcock into the role of President-Elect and Tim Rabbets into the role of Outreach Director.

We would like to thank the following outgoing Council Members; Ian Gibson, Outgoing Immediate Past President, and Stuart Jobbins, Outgoing Outreach Director, for their time and commitment to their roles whilst on the INCOSE UK Council and wish them the very best in the future.

2. ASEC 2024

The Annual Systems Engineering Conference (ASEC) 2024 took place between 5-6 November 2024 and saw the most attendees at an ASEC to date, with a record-high number of first-time attendees. We also had a record number of exhibitors as well as sponsors. Presentations, tutorials, and workshops were well received, and the event ran without a hitch.

The Proceedings are now available to purchase from the [INCOSE UK online store](#).

The Proceedings present the best of the papers from this year's submissions. The printed proceedings will also give the option for those who were not able to attend the event a taste of what happened at ASEC 2024, and hopefully inspire them to attend a



Andrew Pemberton, President



Hazel Woodcock, President-Elect



Tim Rabbets, Outreach Director



future event. We trust that the proceedings will provide a lasting benefit and fitting record of INCOSE UK's ASEC 2024.

3. ASEC 2025 – Save the Date!

The next Annual Systems Engineering Conference is taking place at the Ashford International Hotel, Kent, UK, on 25-26 November 2025. See you there!

4. New Publications

INCOSE UK has released two new additions to the Don't Panic! series: *Don't Panic! The Absolute Beginner's Guide to Agile in Systems Engineering* by Stuart Jobbins and *Don't Panic! The Absolute Beginner's Guide to Systems Thinking* by Robert Black.

Don't Panic! The Absolute Beginner's Guide to Systems Thinking aims to provide advice on the applicability of Agile approaches to cyber-physical Systems Engineering, providing simple tests of the context. It also recognises that Agile Systems Engineering should not be considered as a 'one-size-fits-all' solution; however, for certain process stages, activities or tasks, or at elemental scope, it can prove advantageous.

Don't Panic! The Absolute Beginner's Guide to Systems Thinking introduces key concepts, application prompts, references, and development resources, with particular



emphasis on real-world practice. It also aims to provide a springboard for more advanced students and practitioners of Systems Engineering to undertake further investigation and personal development.

Both new Don't Panic! books are available to buy in eBook and paperback format on the [INCOSE UK online store](#).

Don't forget, Some Don't Panic! books are now available in Japanese!

Don't Panic! The Absolute Beginner's Guide to SysML V2 (Japanese Translation) and Don't Panic! The Absolute Beginner's Guide to MBSE (Japanese Translation) are available in



eBook format on the [INCOSE UK Online Store](#).

Please note that there is no member discount applied to the Don't Panic! book series as they are Third Party Publications.



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A SUCCESSFUL AFIS SYSTEMS ENGINEERING TOUR 2024!

By Jean-Claude Roussel, ESEP, AFIS Associate Director for International Cooperation and Relation with INCOSE

AFIS, the French chapter of INCOSE, initiated in this year 2024 the concept of "Itinerant Thematic Day", consisting of a given theme of collecting various visions and feedback locally. Thus, this "SE Tour" took place in five French cities: Lyon, Bourges, Toulouse, Paris (Vélizy), and Grenoble, marking an enthusiastic and triumphant return to "face-to-face" collaboration for the participating systems engineers.

The selected theme was "Articulation of requirements and models: where are the practices?", which gathered hundreds of concerned engineers.

The applicable scope covered any Requirement engineering activity throughout the life cycle of a System and various typologies of models: cognitive / prescriptive / constructive / productive / formal / analytical. The scope also covered "How to take the relevant benefit of such models to carry out requirements engineering activities."

It was an opportunity to learn from the feedback, discussions, and demonstrations given by individual members and guest speakers. Thanks again to those involved!

AFIS warmly congratulates Régis CASTERAN, one of our AFIS CAB representatives for KAIZEN-SOLUTIONS company and leaders of the "System Life Cycle Processes"



Thematic Committee (which hosts Requirement Engineering projects), for their investment and their efficiency in coordinating this series of events.

Building on this success, AFIS intends to renew this concept by applying it in 2025 to a new theme corresponding to current SE challenges. Maybe AI & SE?



Régis CASTERAN
SE Architect,
IREB certified
KAIZEN-Solutions company



Anne SIGOGNE, CSEP
AFIS Associate Director
for Events
Co-leader of the "System Life Cycle Processes"
Thematic Committee

TDSE 2024 - BOLDLY SHAPING NEW PATHS FOR THE FUTURE

By Carina Loges

From November 13 to 15, 365 systems engineering enthusiasts gathered in Leipzig for the "Tag des Systems Engineering 2024" (TdSE). Under the motto "Boldly Shaping New Paths for the Future," the latest developments and challenges in systems engineering were explored through keynotes, tutorials, technical presentations, and a panel discussion.

A particular highlight was the panel discussion on the role of artificial intelligence in the future of systems engineering, which provided deep insights into current advancements and

challenges in system modeling. The keynote, titled "Model-Based Systems Engineering as an Enabler of Change," was delivered by the distinguished speaker Dr. Elena Cortona. The conference dinner at the historic Auerbachs Keller offered a relaxed atmosphere, providing an excellent opportunity to build valuable connections and exchange insights from the conference.

Overall, the TdSE 2024 was a great success, enriching participants both professionally and personally while highlighting the courage and innovative



spirit in systems engineering. The high level of participation and positive feedback from attendees underscore the conference's importance as a platform

and central meeting point for the exchange of knowledge and ideas in the field of systems engineering.



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Previous Section:
Chapter Updates



Next section:
**Working Groups &
Initiatives Updates**

WHY SYSTEMS ENGINEERS SHOULD CARE ABOUT MATERIALS SCIENCE

By the Materials in Systems Engineering (MatSE) Working Group

Materials science has a history of influencing and revolutionizing product design. Decades ago, new technological developments in polymers radically changed both product and packaging designs. Thermosets plastics were molded for automotive parts and thermoplastics (polyethylene) created for water bottles, to name a few examples. Silicon doping created solid-state electronics (semiconductors), which are now known as electronics after vacuum tubes (non-solid state) became obsolete. Recently, the Euclid Chemical Company developed a new product of polypropylene synthetic macrofiber to replace conventional steel reinforcing bars in reinforcing concrete. Improvements in additive manufacturing of metallic materials will have a significant effect on fabrication of more complex designs such as rocket engine nozzles.

Continuous developments in the field of materials science will further push the boundaries of potential product design, and these changes must be integrated into product lifecycles. Therefore, Systems Engineers should become well acquainted with materials science and its implications for product and process design. Several examples on how systems engineering includes material in the systems lifecycle are:

- For those Systems Engineers following Blanchard and Fabrycky's Systems Engineering and Analysis, lower-level specifications include a material specification. Moreover, the



Figure 1 Picture of Deepwater Horizon oil platform in Gulf of Mexico (Wikipedia, 2024)

- material selection depends upon the product design and other considerations, such as environmental.
- Integrated product and process development. This occurs when both product design and process design happen concurrently. Design for manufacturability is a good example of this contemporary process design. In this approach, producibility influences product design in order to prioritize the economic viability of manufacturing. In addition to achieving capabilities, aesthetics, etc. An example is Boeing Corporation. Boeing achieved enhanced manufacturability by using composites material on the 787 Dreamliner, which minimized the number of parts, fasteners, and manufacturing steps (minimizes chances of errors) for the airframe.
 - Hazard analysis on materials, because material can be a factor for system failure. The 2003 space

shuttle Columbia was lost from foam failure impacting the wing. In 2007, the Interstate I-35 Minneapolis bridge collapsed from gusset plates. And the 2010 Deepwater Horizon oil spill due to insufficient cement between casings.

In the summer of 2024, a few INCOSE members realized the importance of materials science and thought about how non-material experts could include materials and their continued advancements at the early stages of the system lifecycle. This resulted in a new INCOSE Working Group for Materials (MatSE WG). This group was formed in fall of 2024 and all are welcome to join, including additional leaders to assist in championing the working group.

[Visit the MatSE WG webpage.](#)

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JOIN THE SOCIAL SYSTEMS WORKING GROUP AT THE INTERNATIONAL WORKSHOP 2025

To help those planning their schedules for the 2025 International Workshop (IW) 2025, if you are interested in systems science and social systems, plan your mornings to join the systems thinking round tables at the start of each day and the Social Systems Working Group on Monday, Feb 3, from 16:00 to 18:00 CET (10:00 to noon EST). All are welcome to both sessions.

Visit the [International Workshop webpage](#) to stay current on the current schedule and register.



RESILIENT SYSTEMS WORKING GROUP (RSWG) UPDATE

By Ken Cureton

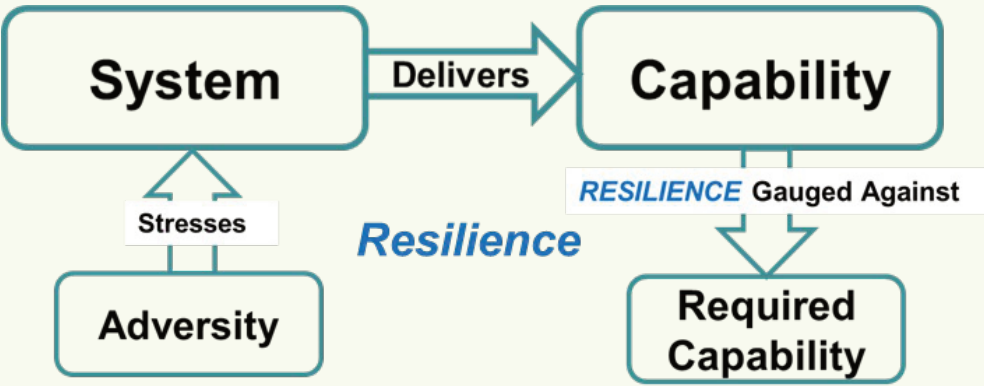
The INCOSE Resilient Systems Working Group (RSWG) hosted a free Webinar on October 9, 2024. This four-hour webinar presented a number of ½ hour topics for which video recordings and presentation slides are available on the RSWG community web page at: <https://www.incose.org/communities/working-groups-initiatives/resilient-systems/>

The purpose of this webinar was to promote best practices and state-of-the-art systems engineering in modern, resilient, complex systems. Approximately 80 virtual attendees gained insight into tools, techniques, processes, and INCOSE resources for systems engineering in producing, operating, and supporting resilient systems. The presenters and topics include:

- Ken Cureton: Role of Complexity in Resilience
- Bill Scheible: Quality Management & Resilience
- Dr. Scott Jackson: Five Case Studies regarding Resilience Engineering

- Dr. Timothy Ferris: Delivery of Services by a System when encountering Adversity
- Tony LiCausi: Survivability and Resilience
- John Brtis: In Search of Adversities, From a Resilience Perspective
- Dr. Ivan Taylor: Linking SysML and System Dynamics for Resilience Modeling

The RSWG also presented “Resilience in Today’s and Tomorrow’s Systems” at the Joint Los Angeles / San Diego Chapter Mini-Conference on November 9, 2024. The presentation slides are also available on the above RSWG community web page and working group Viva Exchange website (see links at the bottom of the RSWG community web page). This presentation also explored tools, techniques, processes, and INCOSE resources for systems engineering in producing, operating, and supporting resilient systems.






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SEASONS OF SYSTEAM: Q4 UPDATES FROM THE INCOSE SYSTEAM INITIATIVE

By Caitlyn A. K. Singam, SySTEAM Program Director, caitlyn.singam@incose.net

“In seed time learn, in harvest teach, in winter enjoy,” wrote the poet William Blake; “[d]rive your cart and your plow over the bones of the dead.” Whilst perhaps not the best advice to take literally (one presumes any adventures in osseous agriculture are best left to the likes of Jason and the Argonauts), Blake’s words do still resonate in the work of the SySTEAM community, and its continued efforts this year in tilling and cultivating the field of systems education. After a productive year of learning and sharing knowledge, so too do we in the SySTEAM community find ourselves taking a short respite this winter, both to enjoy the holiday season and to indulge in a brief look back at the past year.

SySTEAM community meetings

Much like Blake, the SySTEAM community started off the year by learning and growing its collective knowledge; as a group committed to realizing the vision of “improving education for all students, everywhere”,

the SySTEAM community has made it a continuing effort to keep up to date with the latest developments in the world of systems education. To that end, SySTEAM kicked off 2024 and the spring season with the resumption of the initiative’s usual two-hour long online community meetings, providing the opportunity for community input, idea-sharing, and discussion about the latest trends and ideas in systems competency education. As in previous years, each SySTEAM community meeting featured a roundtable-style working-session themed around exploring a different current or emerging topic in systems education. These meetings continued throughout the year, with themes from SySTEAM’s 2024 meetings largely centered around the following key areas:

- developing SySTEAM-recommended standards and assessment criteria for systems-competency reference material and educational sources;
- discussing areas of needed improvement for education & training

- programs related to digital technology skills & related competency areas, such as digital model-based systems engineering (MBSE) and SysML literacy;
- exploring new and emerging challenges facing educators and instructors seeking to add systems competency-related material into their lesson plans and programs; and
- identifying the impact of current sociocultural and sociotechnical trends, such as digitization and automation, on how teaching and learning happen in today’s world.

SySTEAM’s volunteer reviewer program (VRP)

This year also marked SySTEAM’s first true foray into the world of educational resource development through the launch of its volunteer reviewer program (VRP). Interested members of the SySTEAM community can now choose to volunteer via the VRP as potential peer-reviewer candidates for reviewing open-access systems-education resources, with interested volunteers getting matched with participating resource development groups (referred to as SySTEAM’s “coordinating partners” in the context of the VRP) seeking feedback on the free & open-source educational resources they produce.

The SySTEAM VRP program (info sheet: bit.ly/3z81QsK) officially launched in June, with the announcement of

SySTEAM’s first VRP coordinating partner: none other than The Guide to the Systems Engineering Body of Knowledge ([SEBoK](#)). A well-recognized and respected name in the systems engineering world, the SEBoK brings to the table what is effectively a textbook example (in more ways than one) of the type of resource that the SySTEAM community strives to support and



contribute to via the VRP. As a free, online, openly accessible resource on systems engineering knowledge, the SEBoK is a major player in making high-quality systems engineering and systems competency educational material available and accessible to learners from all fields and from all over the globe. Even more importantly, the SEBoK is an evolving reference still being actively developed today – meaning that the review and feedback sent in SySTEAM VRP volunteers will be helping drive actual, tangible improvements in the quality of a key systems education resource, which will

be visible with level of immediacy not often feasible with long-term advocacy efforts.

It is thus safe to say that forging the VRP link between SySTEAM and SEBoK has been a tremendously exciting milestone for SySTEAM. Accordingly, the grand opening of the VRP sign-up form (sign-up link: bit.ly/4ehPHBN) was celebrated with an equally dynamic community-wide kickoff event, where SySTEAM was fortunate enough to have the SEBoK Editor-in-Chief, Nicole Hutchison, as a guest speaker. Volunteer sign-ups for the SySTEAM VRP are continuing to be accepted on a rolling basis, with the first batch of review opportunities anticipated for release in conjunction with the spring 2025 editorial cycle. (For more information, please visit the SySTEAM webpage at incose.org/systeam)

INCOSE alignment

Last, but not least, 2024 also saw SySTEAM participate in strategic alignment with the main INCOSE organization, as part of the ongoing INCOSE-wide strategy review. As an open-door, advocacy-centered community that welcomes (and indeed actively depends on) the full involvement and enthusiastic participation of a wide range of community members from both inside and outside of INCOSE, SySTEAM is perhaps one of the most unique communities in the INCOSE organization, existing outside the scope of the INCOSE Technical Operations Division and other working groups. The SySTEAM community therefore wishes to extend a warm thank-you to INCOSE Executive Director, Steve Records, for having personally taken the time to learn about the SySTEAM Initiative’s needs

and goals during INCOSE’s strategic review earlier this year, and for expressing his desire to ensure that SySTEAM has a stable, long-term home with INCOSE, with the space, flexibility, and open community it needs to continue to flourish as it’s done thus far.

Conclusions

“In seed time learn, in harvest teach, in winter enjoy.” As all of us in the SySTEAM community raise our glasses this year to our third anniversary as a SySTEAM initiative, we do indeed find ourselves looking back on past three years in parallel with those metaphoric seasons. SySTEAM started out its first year learning and growing as a community, with the launch of the SySTEAM community meeting series; we focused on harvesting and sharing that knowledge our second year, most notably through the SySTEAM mini-conference; and now, in our third year, we have focused on cultivating the proverbial field (of systems education) to have the fruits of our efforts once again seed new and further growth in spring 2025 and beyond.

This season, then, finds us in that time in-between the harvesting of autumn and the fresh growth of spring. So, as all of in the SySTEAM community look forward to pulling out our metaphorical carts, and driving over the bones of the past year to make way for the greenery of the new year, we’ll be taking this winter as a time of joy: of being able to enjoy SySTEAM’s successes in learning, growing, and sharing ideas about systems competencies over the past three years, while also looking forward to growing ever-more fruits of those efforts once we’re back from our holiday hiatus in the spring.

Join INCOSE SySTEAM

We always remain on the lookout for new community members, and welcome any interested individuals to join us online via our free Discord community hub (join link: <https://bit.ly/3oy1GmF>). Regardless of your professional background, location, or level of commitment, there’s likely something you can contribute to SySTEAM. If you would like to join SySTEAM, or are interested in learning more about the initiative, please contact the SySTEAM initiative lead and Program Director,

Caitlyn Singam, at caitlyn.singam@incose.net.

We hope you’ll join us as we continue to work towards our goal of improving education for all students, everywhere!



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DIGITAL ENGINEERING INFORMATION EXCHANGE (DEIX) WORKING GROUP UPDATE

By the Digital Engineering Information Exchange (DEIX) Working Group Team

Release of the Digital Engineering Primer in 2025

We are pleased to announce the release of the **Digital Engineering Primer**, a comprehensive document that aims to clarify the concept of Digital Engineering and provide valuable insights into its application across the entire system lifecycle. This primer is designed to enrich the knowledge base of the systems engineering community, offering specialized expertise that will support the ongoing efforts of various **INCOSE working groups** in their respective domains.

The Digital Engineering Primer addresses key questions often raised by INCOSE leaders and stakeholders, offering clear explanations and practical guidance on how Digital Engineering concepts can be applied to enhance system design, development, and operations. The document also serves as an informative prelude to the forthcoming **Digital Engineering Guide**, which is currently under development.

By releasing this primer, we hope to advance the collective understanding of Digital Engineering principles and pave the way for deeper integration of these concepts into existing systems engineering practices.

AIAA SciTech Conference: Digital Engineering Taxonomy Workshop

We are excited to share that the **Digital Engineering Taxonomy Subteam** will be co-leading a workshop with the Digital Engineering Integration Committee at the upcoming **AIAA SciTech Conference** in January 2025. This session will focus on developing a **Digital Engineering Taxonomy**, aiming to establish an ontology-ready common reference concept for understanding and categorizing the core elements of digital engineering practices.

The workshop will engage participants from across industry and academia in a collaborative effort to define key terms, concepts, and relationships that form the backbone of digital engineering. This effort will be aligned with foundational ontology standards and ISO/IEC 81346 reference designation system standard, ensuring that the resulting taxonomy is globally recognized and interoperable across sectors and disciplines. This event marks a significant step in our mission to streamline information exchange and foster collaboration across industries.

2025 INCOSE International Workshop: Collaborative Session on Information Exchange



Looking ahead to the **2025 INCOSE International Workshop (IW)**, the DEIX Working Group will host a **joint session** with the **TIMLM** and **Automotive Working Groups**. The session will focus on **Information Exchange** and explore best practices, strategies for aligning systems, and cross-industry case studies from aerospace, automotive, and defense sectors. This collaborative effort will facilitate the sharing of knowledge and solutions for enhancing information flow across complex engineering environments.

Looking Ahead: A Year of Collaboration and Innovation

The DEIX Working Group is committed to advancing the state of digital engineering by developing common standards and fostering collaboration across industries. The upcoming events at the AIAA SciTech Conference and INCOSE IW are just two examples of the many activities we have planned in 2025.

We encourage all members and stakeholders to participate in these initiatives and contribute their expertise to shaping the future of digital engineering. Stay tuned for more updates on additional workshops, webinars, and collaborative opportunities in the coming months.

Together, we are building a more connected, efficient, and innovative future for digital engineering.

Stay Connected!

For more information about the DEIX Working Group and to stay up-to-date with upcoming events, please visit our website <<https://www.incose.org/communities/working-groups-initiatives/digital-engineering-information-exchange>> or contact us at email <deixwg@incose.net>.

We look forward to seeing you at these exciting events!



STANDING ON AFFINITY: ADOPTING A PARADIGM FOR COLLECTIVE SUCCESS

By Federica Robinson-Bryant, PhD, INCOSE Associate Director of DEI

We've often heard the phrase "standing on business," implying a focus on individual achievement, integrity, and productivity. While this approach has its merits, it often overlooks the power of human connection and collective impact. Today, we invite you to embrace a new paradigm: **standing on affinity**.

By prioritizing empathy, understanding, and belonging, we can unlock the potential of diverse teams and create a more equitable and inclusive future. In today's interconnected world, teams are no longer just groups of similar individuals; they're vibrant microcosms of the global community reflecting a diverse range of backgrounds, perspectives, and experiences. These differences, far from being divisive, can enrich our collective journey, serve as a reminder of our shared humanity, and drive innovation.

Leveraging Affinity Groups as a Catalyst for Change

Affinity groups, also known as employee resource groups, circles, or alliances, have emerged as powerful tools for fostering belonging, driving professional growth, and advancing diversity, equity, and inclusion. These voluntary groups bring together individuals who share common interests, backgrounds, or identities. While they have historically been used to support underrepresented groups, their benefits extend to all



individuals, including engineers and technologists worldwide.

A recent example of the power of affinity groups is the Society of Women Engineers (SWE) Annual Conference, WE24. This global gathering brought together thousands of engineers and organizations and offered numerous opportunities to connect with over 20 affinity groups, such as Early Career Professionals, SWE Athletes, and Women in Government. SWE's affinity groups are a driving force for its global community and are categorized into three areas: Diversity, Equity, Inclusion, and Belonging; Business and Interests; and Career Stages. This broad categorization provides a platform for engineers to network, share experiences, and advocate for diversity

Fostering Innovation & Creativity		
Diverse Perspectives: Individuals with diverse experiences and viewpoints can spark new ideas and innovative solutions to complex problems, often challenging conventional thinking and exploring new approaches.	Shared Knowledge and Expertise: Individuals can share knowledge and best practices, leading to increased efficiency and productivity.	Collective Passion: Individuals with common interests and shared enthusiasm can collaborate more effectively and be more motivated to push boundaries and experiment with new ideas.
Enhancing Engagement & Morale		
Belonging and Connection: Fosters a sense of belonging and community, making individuals feel more connected to their organization/community and motivated to take ownership of projects and initiatives.	Reduced Turnover: Engaged individuals are more likely to stay with their organization, reducing turnover costs and improving retention and engagement.	Increased Satisfaction: Individuals who feel valued and supported are more likely to be satisfied with their jobs, civic engagement, and well-being.
Promoting Diversity, Equity & Inclusion		
Safe Space for Dialogue: Offers a safe space for individuals to discuss challenges, share experiences, and build strong relationships that foster trust and open communication.	Breaking Down Barriers: Breaks down stereotypes and promotes understanding between different groups of individuals.	Mentorship and Sponsorship: Individuals can learn from each other, mentor peers, and provide guidance, support, and feedback for career advancement, reflection, and growth.

and inclusion in the engineering field based on a variety of attributes.

By fostering a culture of inclusion and belonging through affinity groups, we can empower individuals and strengthen organizations' and communities' ability to attract and retain top talent, drive innovation, and improve overall performance. As systems engineers, we can play a crucial role in promoting the value of affinity groups and encouraging our colleagues to participate, whether the primary aim is to foster innovation and creativity, enhance engagement and morale, or promote diversity, equity, and inclusion. Whether you are reading this

article from the lens of an individual, a leader of an organization, or a member of a professional society driving change, you are encouraged to take the first step towards a more inclusive and fulfilling professional journey-

Standing on Affinity as an Individual: Identify an affinity group that resonates with your interests and passions. Whether it's a technical interest group, a mentorship circle, or a social club, connecting with individuals with shared interests can open doors to new opportunities and friendships.

Standing on Affinity as an Organization: Prioritize establishing



affinity groups within your workplace. Review and benchmark well-known examples of effective affinity groups like the Caregivers Circle at Ernst & Young (EY) or Walmart’s broad use of affinity groups for increased employee engagement and satisfaction. Also, identify resources and tools like affinity-specific software and information repositories like Harvard University’s Race, Research & Policy Portal (RRAPP).

Standing on Affinity as a Professional Society: Gather ample understanding of the society’s membership to identify the group(s) needed and appropriate scaling. Allocate resources to support the creation and maintenance of the affinity groups. Effectively communicate about available groups throughout the society and ensure varied methods for members to engage, connect, and collaborate. By providing funding, mentorship, and networking opportunities, professional societies can empower members to thrive.

Above all, plan to work together to build a more equitable and inclusive future for engineering, the systems engineering community, and our shared world.

INCOSE members: Do you have an idea for a new affinity group? Submit your ideas for new affinity groups and volunteer to lead at DEI@incose.net.

Let's stand on affinity, together!

JOIN INCOSE TODAY!



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TOGETHER WE RISE: EWLSE HIGHLIGHTS FROM SWE 2024

By Stueti Gupta, Board Secretary and EWLSE Asia-Oceania Lead

We are thrilled to share our experiences from the Society of Women Engineers (SWE) 2024 Annual Conference, held this year in Chicago from October 24-26, 2024, with the theme “Together We Rise.” The SWE Annual Conference has long been a cornerstone event for women engineers to network, learn, and advance their careers. This year’s conference featured a dynamic array of keynote speakers, workshops, panel discussions, and technical sessions covering the latest trends and breakthroughs in engineering. See <https://advancelearning.swe.org/courses/67277> to watch the three keynotes and five inspirational insights (open to the public; need to establish

SWE login).
As one of the premier gatherings for women in engineering, SWE 2024 brought together over 21,000 participants from diverse engineering disciplines, fostering a vibrant environment of collaboration, innovation, and professional growth. Topics ranged from sustainable engineering practices and emerging technologies to leadership development and career advancement strategies.
We were honored to host an INCOSE EWLSE booth in the exhibitor hall again this year, where we showcased our latest INCOSE products, services, and



initiatives. Federica Robinson-Bryant (Associate Director of DEI), Marilee Wheaton (Past INCOSE President), Stueti Gupta (Board Secretary and EWLSE Asia-Oceania Lead), and Honor Lind (INCOSE MARCOM Director) represented INCOSE at the conference.

Engaging with attendees allowed us to demonstrate our commitment to supporting women in engineering and to connect with like-minded professionals passionate about driving change in the industry. Several INCOSE members visited the booth. It turned out to be a great opportunity to engage them to promote systems engineering and showcase INCOSE's offerings. Federica, Marilee, and Stueti also spoke about career pathways in systems engineering and the success stories of women in systems engineering, highlighting mentorship and leadership opportunities within INCOSE. As an exhibitor, attendees were encouraged to explore the benefits of INCOSE membership, including access to technical resources, Certification, and a global professional network.



Our key insights and takeaways include:

1. The Power of Building Supportive Networks: One of the standout aspects of every SWE annual conference is the emphasis on building supportive professional networks. Attendees highlighted the importance of mentorship and peer support in navigating career challenges and achieving personal goals. Stueti and Federica attended affinity group meetings.
2. Leadership and Empowerment: Keynote sessions focused on personal success, leadership skills, and empowerment strategies that resonated deeply with participants. Empowering women to take on leadership roles remains a critical focus, and we are committed to fostering an inclusive environment that supports this vision.
3. Diversity and Inclusion: The conference reinforced the importance of diversity and inclusion within engineering teams. Diverse perspectives drive innovation, and we are dedicated to promoting an inclusive culture where every voice is heard and valued.

“My experience with the Society of Women Engineers has been transformative. It’s more than just a network—it’s a community that champions each other’s successes. Being surrounded by



talented, driven women, especially at the ‘Together We Rise’ event in Chicago, has not only expanded my technical skills but also fueled my passion for advancing diversity in engineering. SWE showed me that our collective strength can break barriers and redefine what’s possible.” — Honor Lind

“As a long time life member of SWE, it is always an uplifting and reinvigorating experience to attend the annual conference. Sharing insights at the WE Career and Exhibit Fair on INCOSE and systems engineering as part of EWLSE outreach is an opportunity for me to pay it forward to professional and student attendees.” — Marilee Wheaton

“Each year at the SWE annual conference, my most invaluable takeaways are the moments of engaging conversation that span beyond the technical aspects of engineering and into the personal factors of people. I enjoy the opportunities to exchange empathy, the chance to empower one another, and most importantly, the hypervisibility of the impact both women in engineering at large and diversity, equity, and inclusion within the engineering field - past, present, and future. SWE is truly the most fulfilling conference of the year and an impetus for INCOSE’s continued presence in the room.” — Federica Robinson-Bryant

“My first National Conference was in Chicago in 2011, and coming back to Chicago was a full circle moment for me to see the tremendous growth of this wonderful community. This year, I experienced SWE with a different dimension, exhibiting at the career fair promoting INCOSE and the opportunities it presents for engineers.

As usual, the keynotes are awe-inspiring, and personal stories get etched in your heart. It’s always energizing to meet with SWEsters from all over the world and learn how they are making an impact in their geography to inspire girls and women to stay in STEM careers.” – Stueti Gupta



SWE 2024 was not only a platform for showcasing our work but also a source of inspiration and motivation. The connections made and insights gained will undoubtedly influence our strategies and initiatives moving forward. We are excited to implement new ideas and continue our mission to support and empower women in engineering. Thank you to everyone who visited our INCOSE EWLSE booth and contributed to the vibrant discussions at SWE 2024. Stay tuned for more updates and stories from the frontlines of engineering innovation! We will be supporting WE25 (SWE 2025) in New Orleans, LA, from October 23-25, 2025. If you attended SWE 2024 and have stories or feedback to share, we’d love to hear from you! Reach out to us at ewlse-leaders@incose.net. For more information about EWLSE and DEI in INCOSE, please visit our websites: <https://www.incose.org/ewlse> and <https://www.incose.org/dei>.



INCOSE AT THE 2024 SMART CITY EXPO WORLD CONGRESS

By Jennifer Russell, EISE, CSEP, Smart Cities Initiative Chair

Tracking, sensors, and AI, oh my! The 2024 Smart City Expo World Congress in Barcelona, Spain did not disappoint. Open minded, collaborative, world-class innovators joined together to make our world and lives better. Global powers from across the world hosted their superstars of technology and development. Each of these bright stars was present and motivated to show how their technology and services contribute to the smart cities landscape.

It was INCOSE’s first attendance at such an event and we were the only professional organization. We had five members of the Smart Cities Initiative to host visitors to our booth and talk with solutionists from across the world. Carrie Cabak and Brian Pierce supported the booth as representatives of NSI, a systems engineering company in California. Jargal Dugar and Bayaraa Batsaikhan of TUSS, a social systems engineering company in Mongolia, discussed the details of our human-centered approach with attendees. And I had the opportunity to share our ideas

as part of a panel on human-centered approaches to smart cities.

It was an honor to represent [INCOSE](#) on an Expo-hosted panel and present our Smart Cities framework that incorporates fundamental human needs into smart city efforts. The 9 Fundamental Human Needs, published by Max Neef in 1986, are a holistic way to include humans in planning smart city applications. These form the basis for our systematic approach to defining, measuring, and managing smart cities applications.

My fellow panelists offered additional



human-centric perspectives on smart cities. [Marta Junqué](#) represented the [Time Use Initiative - TUI](#) to comprehensively manage wasted time; [Carla Kranenburg-van Eerd](#) presented on her city’s (Breda, Netherlands) integrated accessibility app; [Mariusz Sagan](#) presented on integrating 25,000 stakeholder viewpoints into Lubin, Poland’s strategic plan; [Anneli Simm](#) presented a tool for the physical measurement of wellbeing! Each is providing so much value for their respective communities and areas of impact!



As SEs, you will not be surprised to hear that much of the technology we saw was a solution looking for a problem. Many solution providers are focused on developing the technology. In seeing this, we all took heart in the need for systems engineering and SEs to be tightly involved in smart cities development. Defining the city’s real needs and connecting a solution that meets those needs will be a value that our community can bring in force. In addition, there were a few examples of



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open-source solutions that enable integration and connectivity. One example was in Five + Cities Connected (5+CC) initiative. Hamburg, Helsinki, Prague, Rotterdam, Singapore, and Vienna have collectively developed a platform on an open-source model that enables them to share code and practices they develop independently. The cities are finding cost and time savings benefits by sharing, which is valuable encouragement for open-source solutions.



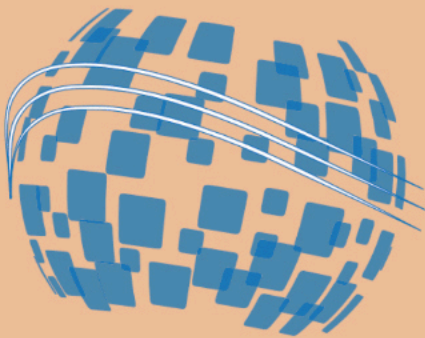
The smart cities world is expansive and growing. INCOSE, and we as systems



engineers, can find ourselves in the middle of it, using our transdisciplinary principles and practices that enable the realization of successful systems.



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2025
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HYBRID EVENT
Seville, SPAIN
February 1 - 4, 2025



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HOW UNIVERSITIES ARE LEVERAGING INCOSE'S CAB TO EMPOWER STUDENTS

INCOSE's Corporate Advisory Board (CAB) is the "voice of the customer" for businesses of all sizes and topics to engage with INCOSE. Universities have a special path to CAB membership with no initiation fee and they are allowed up to 300 CAB Associate accounts. Why do they need so many CAB Associate accounts? Students.

Students are the reason that most Academic members of the CAB joined, with nearly 50 universities now in the CAB. Universities join the CAB so that their students can get free access to the INCOSE SE Handbook and other INCOSE products, reducing the expenses students might otherwise spend on textbooks. Don Gelosh, CAB Representative for Worcester Polytechnic Institute, says about CAB Associate status, "This is very important to our SE students so they can get the INCOSE references they need for our courses. It's actually a mutual benefit to WPI and INCOSE: we get the ability for our students to download references, and INCOSE gets a great pool of future members! INCOSE also gets recognition for their excellent resources."

Other benefits to CAB membership? The CAB has a seat on the INCOSE Board of Directors, and the CAB provides guidance to INCOSE through its list of priorities. And universities that are members of the CAB are eligible to apply for Academic Equivalency (AcEq). More than half of the CAB universities participate in the AcEq program, and

more than 1,000 students are anticipated to benefit from AcEq in 2024.

Finally, being part of the CAB is something that a university can advertise as a signal about the type of systems engineering that they do. They position themselves as part of the organization that is "developing the global community of systems engineers and systems approaches to problems."



INCOSE PROUDLY PARTICIPATES IN SYSTEMS WORKFORCE SUMMIT

INCOSE was proud to be a part of the recent [Systems Workforce Summit](#) held at Delft University of Technology in the Netherlands on October 8th and 9th, 2024. This event brought together nearly 200 top-level professionals and executives from across the globe to address the growing need for skilled systems engineers in an increasingly interconnected world.

INCOSE was well-represented at the summit: Executive Director Steve Records acted as an Associate Chair for the event and facilitated a panel regarding the role of professional organizations in workforce development. President Ralf Hartmann presented on INCOSE's professional development resources available to members. Former President Kerry Lunney also acted as an Associate Chair and presented the value of systems competencies and

Systems Engineering Quality Management (SEQM). Additionally the conference was attended by many INCOSE members.

Attendees experienced two full days of powerful presentations and engaging discussions around five central themes: Context and System Needs, Industry System Workforce Needs & Sustainment, Education of System Engineers, Agencies System Workforce Needs, Roles & Contributions, and Professional Organizations on System Needs & Opportunities. From healthcare and aerospace to energy and public infrastructure, systems of systems are becoming the backbone of modern society. However, the workforce required to manage and realize these systems is critically scarce. The presentations and discussions at the summit focused on critical observations and recommendations within the central





themes that helped identify pathways to mitigate current workforce deficits.

The summit underscored the urgent need for a multi-pronged approach to nurturing the future generation of systems professionals:

- Universities: Integrating systems-related courses into curriculums to foster interdisciplinary thinking.
- Industry: Continuous workforce development through training programs to keep pace with technological advancements.
- Government: Policies that incentivize systems workforce development to drive long-term success.
- Real-world projects: Engaging in multidisciplinary, practical projects to hone hands-on expertise.

Call for Action

The summit helped to outline a clear call for action directed to the global systems policy, analysis, management, and engineering communities. The demand for skilled systems engineers is rapidly outpacing the current talent pool. Now is the time for stakeholders to collaborate and invest in the future of systems engineering. INCOSE is honored to be a part of this important initiative as the premier professional association for systems engineers. As we continue to drive our mission of fostering systems engineering knowledge exchange, application, education, and research, we are dedicated to being the world's trusted authority and forum for the

practice, science, and art of systems engineering.

INCOSE is doing our part to work towards the summit's call for action. We are proud to be able to offer our membership professional development opportunities to advance knowledge and skill sets, certification to demonstrate technical aptitude, working groups to create products and advance the practice, publications to stay current on the latest industry insights, events to connect across domains and regions, tools and databases to utilize from top vendors, and numerous networking opportunities to collaborate with other systems engineers across the globe.

By working together, we can bridge the gap and ensure a robust workforce capable of addressing the complex challenges of the 21st century.

For more information about the Systems Workforce Summit, including the full Call for Action, visit <https://systems-workforce.eu>.



WHAT IS EQUITY REALLY?

By Heidi Hahn

When we hear the term “equity” in the context of diversity, equity, and inclusion most people are probably thinking about equity of outcomes. In academia, this might mean equal outcomes in course grade achievement, in health care, equal (and low) hospital readmission rates, and in corporate settings, equal pay.

Generally, equity of outcomes is seen as a worthy goal in and of itself. While many people see it as unfair, it is a common practice to achieve equitable outcomes by lowering standards for everyone. Thorp (2022) argues that it doesn’t have to be this way, stating that “inclusion doesn’t lower standards” and pointing out that in academic settings, at least, there are many different approaches that have been shown to allow demographically diverse students to be successful in their learning without lowering educational quality.

Others take the equity argument a bit further and say that what’s really needed is something Rodriguez, Brewe, Sawtelle, and Kramer (2012) call “equity of parity,” by which they mean not only that outcomes should not be predictable from demographic characteristics but also that there should be no demographic achievement gaps, even if there are demographic differences in measures that represent the quality of a group’s “preparation”. In academia, “preparation” might mean students’ SAT/

ACT scores but might also be reflected in parental education, family history, or membership in an underrepresented class. In health care, family history, educational attainment, and class status may all be in play, as may be prior access to health care. In corporate situations, educational background, class status, and the family situation (i.e., having small children at home, caring for an elderly parent, etc.) may also be a factor leading to apparent pay inequities. Within the equity of parity model, then, the goal is not only to have equitable outcomes but also to not perpetuate past inequities.

Unfortunately, neither past nor future inequities are likely to be solely manifested as inequities in achievement of outcomes. It is important to remember that eliminating achievement gaps does not necessarily eliminate all of the equity gaps that might be present. Other equity gaps still might exist. Gutierrez (2008) notes that underrepresented demographic groups are denied equity not only in terms of achievement but also in terms of access and inclusion, identity, and/or power. She argues that an achievement gap-only focus is dangerous because it offers little more than a static picture of inequities; supports deficit thinking and negative narratives about people based on their race, gender, and/or class; perpetuates the myth that the problem (and,

therefore, the solution) is a technical one; and promotes a narrow definition of equity. She further argues that inequities in access and inclusion, identity, and power will require at least institutional, if not societal, remedies. In sum, we need to broaden our thinking as to the definition of equity to include these factors, strive to understand and address inequities defined in this broader way, and refrain from focusing our attention on outcomes alone. Only then will we have a path to attaining true equity.

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Rodriguez, I., Brewe, E., Sawtelle, V., and L. H. Kramer, L. H. (2012). Impact of equity models and statistical measures on interpretations of educational reform. *Physics Review Physics Education Research*, 8 (2), 1-7.

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DIGITAL ENGINEERING AND HUMAN SYSTEMS INTEGRATION COME TOGETHER

By Guy André Boy, INCOSE Fellow

During the 20th century, engineering design always started with hardware development. Mechanical engineering was the central discipline in engineering. Electronics and software engineering emerged during the last decades of that century to generate unavoidable approaches and techniques. We ended up with a shift from hardware to software. For example, people no longer must fix the carburetor of their car, but they can go to the nearest car subsidiary or workshop to have their car diagnosed and fixed. Everything is now a matter of software. When you have a problem with your vehicle, you are immediately told how much it will cost. Everything is integrated.



It is interesting to notice that we have been doing the opposite since the beginning of the 21st century. We start with software and end up with hardware. Everything usually starts with a set of PowerPoint slides that are sometimes animated. Models are developed and visualized. Scenarios are developed. Human-in-the-loop simulations (HITLs) are set up and run to observe various kinds of activity (i.e., what is effectively performed). Activity analysis often reveals emergent behaviors and properties of the sociotechnical systems at stake. By doing this, we can discover and formalize emergent functions and even structures that we forgot in the first place. Emergence is a significant

property of complex systems, particularly sociotechnical systems (STs). Let's take a historical perspective of the evolution of engineering and human factors since World War 2 (Figure 1). Up to the 1980s, mechanical engineering was the dominant discipline in engineering. Consequently, human factors and ergonomics (HFE) developed considering physical, physiological, and health issues at work. Work physicians were the referent experts in that field. Then came the micro-computer revolution (i.e., everybody started to experience digital media at work and home). Human-computer interaction (HCI) developed during the 1980s and 1990s. Cognitive engineering became dominant. Since the beginning of the 21st century, computer networks and the Internet have grown steadily. Complexity never stopped to increase. The problem of a human facing a computer was no longer the main issue, but the role of people in complex STs became dominant. Human systems integration (HSI) was born and is nowadays a discipline taught in a few engineering schools worldwide. HSI started as a combination of systems engineering (SE) and human-centered design (HCD) because systems could not represent machines only but people and organizations also. In other words, we consider the concept of a system as a representation of humans and machines, having structures and functions. STs are systems of systems (SoSs) where machines can include people, and people can include machines. Digital engineering allows the

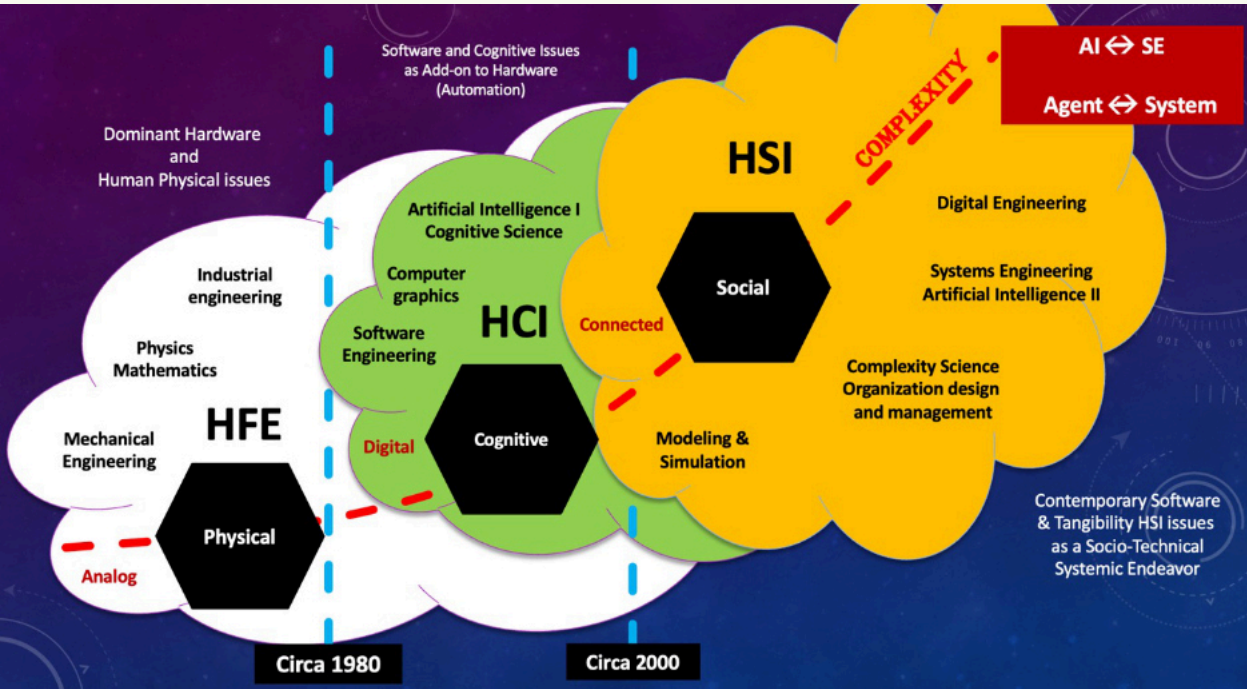


Figure 1. Contemporary evolution of engineering and human factors (physical, cognitive, and social).

development of models and HITLs, enabling observing human activity at work before any development and manufacturing. The fact that activity could be analyzed very early during the design process using virtual prototypes makes HCD, and consequently HSI, possible. The caveat is tangibility (i.e., the distance between the virtual world and the reality). Tangibility is physical and figurative (i.e., cognitive); that is, we need to physically and cognitively grasp what is being digitally developed. HSI developed for the last twenty years, trying to get a proper definition. Building an aircraft, for example, is more than assembling iron structures and electric functions. It requires figuring out a large number of scenarios that involve the use of this aircraft in a large variety of configurations, whether high-density traffic, difficult weather situations, or a more significant number of passengers, and therefore, a holistic approach that mixes flight and air traffic management.

The question now is not so much about having HSI as a part of SE but rationalizing SE to be part of HSI. In addition, we have started to realize how much SE is like multi-agent artificial intelligence (AI). The multi-agent system concept in AI is close to the SoS concept in SE. It is, therefore, interesting to cross-fertilize these two fields of investigation. This is why it is time to associate SE (especially SoS and model-based SE), HFE (including activity analysis and socio-ergonomics), and information technology (including AI, HCI, and other modeling and simulation techniques). This is precisely what HSI is about.





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INCOSE SERVICES ENHANCE MEMBER BENEFITS

By Dr. Heidi L. Davidz, CSEP, Services Director

INCOSE Services is a group of offerings supported by volunteers and staff to provide member value through impactful services. The value provided to members continued to grow in 2024, and we encourage you to utilize the services listed in the table below.

For the Certification program, the certifications awarded in 2024 through the end of October include 637 Associate Systems Engineering Professionals (ASEP), 407 Certified Systems Engineering Professionals (CSEP), and 19 Expert Systems Engineering Professionals (ESEP). There are now 27 universities in the academic equivalency program, where coursework can replace the knowledge exam.

The SE Lab has 25 vendor-supported tools and 2 open-access tools provided by 13 tool vendors, with more vendor agreements in progress. There are 563 tool users as of November, and over 20 INCOSE teams are using the lab for

collaborative project space. At the 2025 INCOSE International Workshop (IW), a session will feature SE Lab vendors providing overviews of their tool(s).

For the Forum, a series of “Demo Days” has started to showcase each SE Lab tool, and each demo will be recorded for reference. The October Calling All Systems (CAS) featured SysML v2, and the November CAS will address “Requirements Renaissance.”

The Technical Leadership Institute (TLI) is onboarding new coaches. Cohort 9 major project workshops are completed, and the Cohort 8 recognition campaign is underway. TLI social and topical engagements are planned for the 2025 INCOSE International Workshop (IW).

In work is an artificial intelligence application that will respond to natural language prompts drawing from INCOSE materials. An ontology development and natural language processing effort is also in work for the

Service	Value to You	Location
Certification	Formal recognition of progress through your SE career	https://www.incose.org/certification
Systems Engineering Lab	Modeling infrastructure to collaborate on INCOSE projects; discover and experiment with SE tools	https://www.incose.org/selab
Professional Development Portal (PDP)	Enhance SE knowledge and skills using learning resources mapped to the INCOSE SE Competency Framework	https://www.incose.org/pdp
Technical Leadership Institute (TLI)	Global learning network improving technical leadership skills	https://www.incose.org/tli
Mentoring	Guidance from experienced SE professionals	https://www.incose.org/mentoring
Forum (Calling All Systems, Webinars, Cafes)	Learn from industry SMEs	https://www.incose.org/events/calling-all-systems , https://www.incose.org/events https://www.incose.org/events/systems-exchange-cafes

automated tagging of PDP and other INCOSE resources.

enhancing the value and impact these services provide to you in 2025!

If you have questions on individual offerings or if you would like to get involved and contribute, please do reach out. We encourage you to fully utilize the benefits included in INCOSE membership, and we look forward to



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SETDB: YOUR GATEWAY TO THE LATEST ENGINEERING TOOLS

Are you tired of sifting through countless software options trying to find the perfect tool for your next project? Look no further! Your INCOSE membership gives you exclusive access to the [Systems Engineering Tools Database \(SETDB\)](#).

SETDB is your one-stop resource for identifying the best software tools and cloud services that align with your specific needs.

Here's what makes SETDB invaluable for INCOSE members:

- **Targeted Tool Selection:** Forget generic software lists. SETDB categorizes tools based on systems engineering processes. This means you can find the perfect tool for activities ranging from Design Thinking to Prototyping to Testing, all in one convenient location.

- **Streamlined Search:** Save precious time with SETDB's intuitive interface. Simply select your desired process stage and explore a curated list of relevant tools.
- **Detailed Information:** Gain valuable insights into each tool with comprehensive descriptions, vendor information, and direct links to tool listings.

With SETDB, you can boost your efficiency by finding the right tool faster, enhance your project outcomes by leveraging industry-approved solutions, and stay ahead of the curve by exploring the latest software innovations.

Simply [access the database](#) and login using your INCOSE member credentials. Don't have an account yet? Create one on the [iNet](#) today!



SYSTEMS ENGINEERING TOOLS DATABASE WORKING GROUP

Provides the systems engineering community a reliable source of information about software tools they are using or wish to use while executing their business processes throughout a product lifecycle.

SEBOK V2.11: ADVANCING THE SYSTEMS ENGINEERING BODY OF KNOWLEDGE

INCOSE is thrilled to announce the official release of SEBoK v2.11, the latest update to the essential resource for systems engineers worldwide! This edition builds upon the wealth of knowledge in previous versions, offering valuable new insights and resources to enhance your practice.

New features of v2.11 include:

- New articles on critical topics:
 - **Barriers to Successful Embedding of Systems Engineering into Organizations** (in Part 5): Gain deeper understanding of the challenges faced when integrating systems engineering practices within organizations and explore strategies for overcoming them.
 - **Cost Estimating and Analysis in Systems Engineering** (in Part 6): Refine your approach to cost estimation, a crucial aspect of successful project management
 - **Resilience Modeling** (in Part 6): Learn how to leverage modeling techniques to build robust systems capable of withstanding disruptions and adapting to changing environments.
 - **Related Disciplines** (in Part 6): Read a refreshed introduction about how systems engineering interacts with other fields to shape and be shaped by its operational environment.
- The Editorial Board is working on updates to reflect version 5 of the INCOSE Handbook and the 2023 version of [ISO/IEC/IEEE 15288]. In

some instances, updating materials to reflect the current version will require substantive rework. These changes will be worked into the next release of the SEBoK.

- **Ongoing Improvement:** Our commitment to providing the most accurate and relevant information continues with continual refinements and updates to existing SEBoK articles.

Contribute to the SEBoK and [get involved!](#)

As a living document, the SEBoK thrives on the active participation of the INCOSE community. SEBoK v2.11 introduces a new content review form, making it easier than ever for you to provide feedback and suggestions for future edits. Your insights are invaluable in ensuring the SEBoK remains a cutting-edge resource for the ever-evolving field of systems engineering. You can also get involved by becoming an author, assistant editor, or lead editor. Visit the newly created [Get Involved](#) page to learn more.

We encourage you to explore the new articles, revisit existing content, and actively participate in the SEBoK review process. By working together, we can make the SEBoK an even more powerful tool for advancing the practice of systems engineering worldwide.

Head over to [the SEBoK website](#) to see the latest version and discover the wealth of knowledge it offers!



SEBoK
GUIDE TO THE SYSTEMS ENGINEERING
BODY OF KNOWLEDGE

HOSTING A CERTIFICATION EXAM

By Courtney Wright, ESEP, INCOSE Certification Program Manager

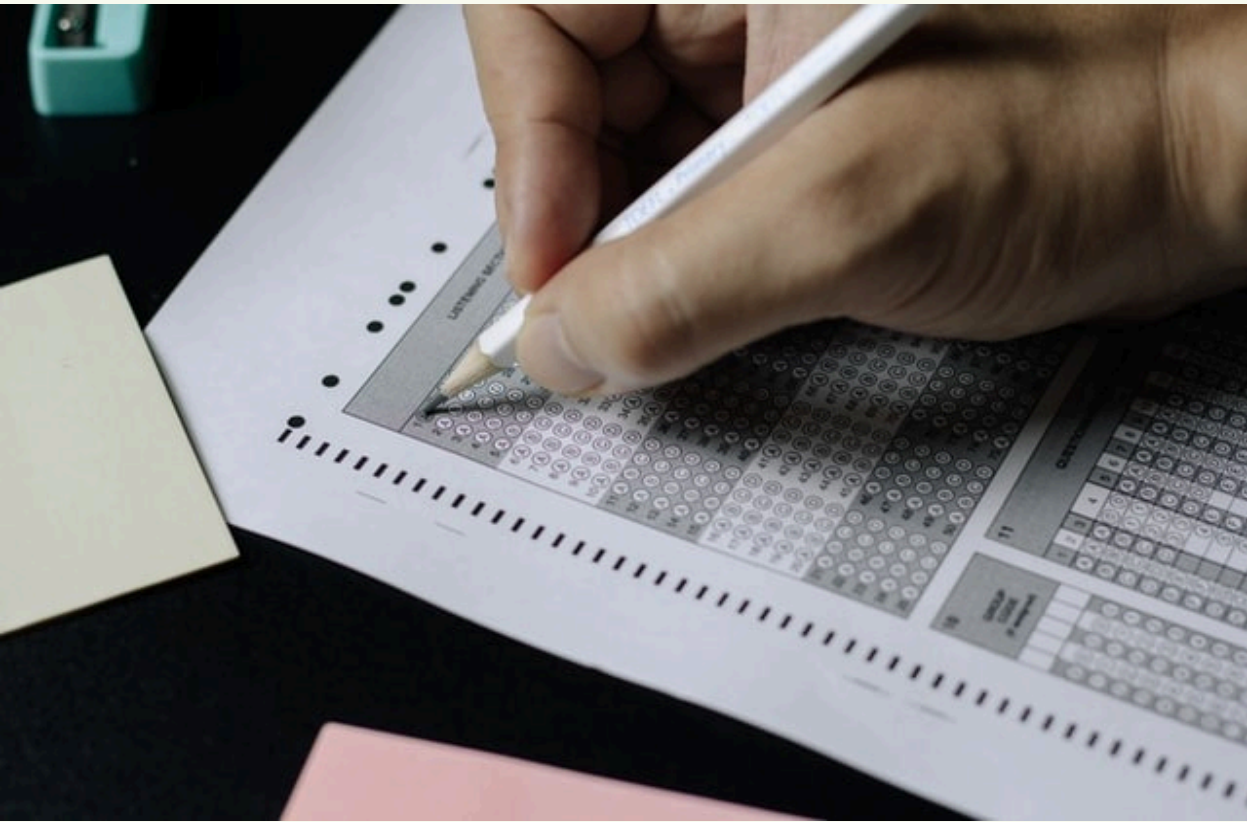
INCOSE chapters find that the INCOSE knowledge exam is a topic of interest and professional development for their members and future members. The exam is hard, and chapters often build study groups around the preparation for it.

Individuals applying for ASEP or CSEP certification must prove their knowledge of systems engineering concepts by either passing the knowledge exam or an approved equivalency. The knowledge exam is offered in two ways: online and in-person. Online exams are taken on a computer with a remote proctor, while in-person exams are

taken on paper in a group of other candidates with a proctor in the room.

Those who wish to choose the time and location when they take the exam will pay \$80 to connect with a remote proctor. They can schedule that exam before or after they apply for certification. If they have not already applied, they should create an INCOSE account (no payment required) and request access to the exam at <https://portal.incose.org/certifications/certificationExams>

Chapters and INCOSE-sponsored events may request to host an in-person exam locally for their community. This is



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offered at a lower cost of \$30 per person (free for students).

The Chapter or Event must provide the following for an in-person exam:

- Approved CSEP or ESEP to proctor the exam, endorsed by both the chapter president and the Certification Program Office
- Facility with tables, offering at least one-meter space between each candidate
- Facility must be available for at least 2.5 hours (20 minutes for instructions, 100 minutes for most candidates, and 30 extra minutes for some candidates)

If you are a chapter interested in hosting an INCOSE Knowledge Exam, please fill out the [Exam Request Form](#).

Companies frequently request that the exam be offered in their corporate offices. INCOSE is happy to do this, so long as we can avoid a conflict of interest or advantage for any company. Exams should be open to all local INCOSE members, and the proctor should not be from the same company as the majority of participants. It is possible for an exam to be held with limited access (e.g., in a private company facility) if there is another



exam offered to a public audience within close timing and location. Exam requests should be coordinated with the local INCOSE chapter.

All exams offered both online and in-person are based on the overlapping content between the Fourth and Fifth Editions of the INCOSE SE Handbook through 14 March 2025. On 15 March 2025, all exams will transition to content from the Fifth Edition, which may not be found in the Fourth Edition. Candidates who study based on the Fourth Edition should plan to take the exam before 15 March 2025.

If you have any further questions, please contact certification@incose.net.



Thank you to our platinum sponsor, Dassault Systemes, for their ongoing support!



THE NEW INCOSE CAREER CENTER: CONNECTING TALENT WITH OPPORTUNITY

INCOSE is excited to announce the launch of the new Career Center, a new online platform designed to connect talented professionals with exciting career opportunities in the systems engineering field.

For Employers

The Career Center offers a unique opportunity to showcase your company and advertise your open positions to a highly qualified audience that is already connected to the voice of authority in systems engineering.

You can post job positions in the database and even purchase spotlight advertisements to make sure your opening is highlighted.

For Job Seekers

The Career Center is your one-stop shop for finding the latest job openings,

including postings from organizations on [INCOSE's Corporate Advisory Board](#). In addition to being able to browse job postings tailored to your skills and experience, you can also get:

- Resume and cover letter writing assistance
- Interviewing tips and advice
- Industry outlook and wage information
- Personalized guidance from a certified career coach

Sponsorship Thank You

We would like to extend a special thank you to Dassault Systèmes for their generous sponsorship of the INCOSE Career Center. Their support has been instrumental in making this valuable resource a reality.

Visit the [INCOSE Career Center](#) today!

INCOSE'S LATEST TECHNICAL PRODUCT RELEASE: THE NEEDS AND REQUIREMENTS MANUAL (NRM) VERSION 2

The *INCOSE Needs and Requirements Manual* (NRM) presents product development and systems engineering concepts, activities, and artifacts from the perspective of needs, requirements, verification, and validation across the system lifecycle. Composed of 16 chapters, the NRM provides practical guidance to help organizations understand the importance of lifecycle concepts, needs, requirements, verification, and validation activities, enabling them to successfully and effectively implement these activities during product development, systems engineering, and project management.

The parent *INCOSE Systems Engineering Handbook* divides the

system lifecycle into a series of processes, with each process described in terms of a series of activities. The NRM provides more details needed by practitioners to successfully implement these activities, with guidance and lessons learned from hundreds of years of collective experience of the authors, contributors, and reviewers. For example, while the SE HB mentions the need to define the problem statement, mission, goals, and objectives for a system, the NRM provides detailed guidance for doing so.

[Go to the INCOSE Store to download the manual today!](#)

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SEVILLE CALLING: THE INTERNATIONAL WORKSHOP 2025

The International Workshop (IW) travels to Seville, Spain, 1 – 4 February 2025! The IW offers a unique opportunity to collaborate with fellow systems engineers from around the globe and drive the future of the discipline. The workshop will be provided as a hybrid event, both online and in Seville at the Barceló Sevilla Renacimiento.

A Different Kind of Conference

Unlike traditional conferences, IW2025 focuses on hands-on, collaborative work. Attendees will spend four intensive days engaging in working sessions, brainstorming new ideas, and developing innovative solutions to real-world challenges. This interactive format encourages knowledge sharing, cross-pollination of ideas, and the development of strong professional relationships.

Why Attend IW2025?

- Shape the Future of Systems Engineering: Contribute to the evolution of the discipline by participating in focused working sessions.
- Network with Global Experts: Connect with leading systems engineers from diverse backgrounds and industries.
- Gain New Insights and Skills: Learn from experienced practitioners and explore cutting-edge technologies.
- Advance Your Career: Demonstrate your commitment to professional development and industry leadership.

Key Focus Areas for IW2025 include:

1. Energy Transition: Explore the role of



- systems engineering in addressing climate change and enabling a sustainable future.
2. Digital Twins: Discuss the development and application of digital twins to improve system design, operation, and maintenance.
 3. MBSE: Advance the practice of Model-Based Systems Engineering and its impact on system development.
 4. SysML v2: Contribute to the evolution of the Systems Modeling Language and its future capabilities.

Seville: A City of Cities

Seville, a vibrant city with a rich history and culture, provides the ideal setting for IW2025. Enjoy the stunning architecture, delicious cuisine, and warm hospitality of this beautiful Spanish city.

How to Get Involved

- Attend the Workshop: Register now to secure your spot at this exclusive event. In-person registration is now open, and virtual attendance registration will open on 1/1/25.
- Sponsor the Event: Support the workshop and gain visibility for your organization at the systems engineering event of the year.

To learn more about IW2025, including information on travel, registration, accommodations, and sponsorship opportunities, visit [the official website](#).

Join us in Seville and make a difference!

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UNLOCKING OPPORTUNITIES: THE VALUE OF SPONSORING THE INCOSE INTERNATIONAL WORKSHOP 2025 IN SEVILLE

By Honor Lind

As the field of systems engineering continues to grow, so do the opportunities for organizations to showcase their thought leadership, expand their networks, and contribute to the advancement of the industry. One of the most impactful ways to achieve this is through sponsorship of high-profile events like the **INCOSE International Workshop (IW) 2025**, set to take place in the vibrant city of Seville, Spain.

For over three decades, INCOSE has been a driving force in fostering collaboration, knowledge-sharing, and innovation across industries. IW is one of INCOSE's flagship events, bringing together systems engineering professionals from around the world to collaborate on projects, refine best practices, and address the most pressing challenges in the field.

In this article, we explore the **value of becoming a sponsor** for this prestigious event and the strategic advantages it brings to organizations committed to staying ahead in the ever-evolving landscape of systems engineering.

1. Brand Visibility and Industry Recognition

Sponsoring IW places your organization in front of a highly targeted audience of **over 500 global systems engineering professionals**, decision-makers, and thought leaders. This event is attended by thought leaders and experts from diverse sectors, including aerospace, automotive, defense, healthcare, and technology.

BECOME A SPONSOR OF INCOSE IW2025

Key benefits:

- Engage with systems engineers
- Connect with leaders
- Make an impact!

Contact Us: sponsors@incose.net



According to **John Smith, Director of Systems Engineering at Lockheed Martin**:

"Partnering with INCOSE's International Workshop has been invaluable for us. It's not just about visibility—it's about engaging with a passionate, forward-thinking community that drives real change in systems engineering. The connections we've made here have directly influenced our innovation pipeline and expanded our reach globally."

2. Foster Strong, Long-Term Relationships with Key Stakeholders

Sponsoring IW offers more than just visibility; it's an opportunity to **build and strengthen lasting relationships** with industry stakeholders.

"Businesses have a lot to gain by sponsoring your association's event. Beyond recognition and exposure to potential clients and customers, companies that practice corporate philanthropy gain positive brand lift and awareness that impacts employee satisfaction and community relations. Strengthen these partnerships after the event through regular communication—check-in phone calls or emails, invitations to association events, or even informal chats over coffee. Keeping tabs on their business and personal milestones helps lay the foundation for future support."

(Source: ASAE, "Strengthen Sponsor Relationships," [ASAE Center](#))

3. Direct Access to Key Decision-Makers and Influencers

IW is designed for **deep engagement**, with interactive sessions, technical discussions, and collaborative working groups. This structure provides sponsors with unparalleled opportunities to **connect one-on-one with industry leaders** and decision-makers who are shaping the future of systems engineering.

4. Establish Thought Leadership in Systems Engineering

For organizations looking to solidify their position as industry leaders, sponsoring IW offers a unique platform to demonstrate expertise. As a sponsor, you receive registration access which gives your organization the ability to connect and be a part of discussions as you will be able to participate in conference sessions that help shape the discussions around key industry topics.

5. Access to Cutting-Edge Research and Insights

IW is renowned for its **focus on hands-on collaboration and problem-solving**, rather than traditional conference-style presentations. By attending the conference and building a presence, you as the sponsors will gain access to the latest research, methodologies, and tools discussed during the event, which can directly inform their business strategies and product development.

6. Enhance Talent Acquisition and Employer Branding

In a field where top talent is in high demand, sponsoring IW provides organizations with a unique opportunity to **highlight their commitment to professional development and**



innovation. By being visible at this event, sponsors can attract and engage with the best and brightest in the systems engineering community.

Seize the Opportunity in Seville

Sponsoring IW is more than just an opportunity to increase your brand's visibility; it's a strategic move that positions your organization at the heart of the systems engineering community. From enhancing your brand's reputation to building invaluable connections, the benefits of sponsorship are both immediate and long-term.

Whether you are looking to generate leads, establish thought leadership, or contribute to the advancement of the profession, the International Workshop offers the perfect platform to achieve your goals.

Ready to elevate your organization's impact? Contact us today to explore sponsorship opportunities and secure your place at the INCOSE International Workshop 2025. Together, let's shape the future of systems engineering!

Visit [INCOSE IW2025 Sponsorship Program](#) for more details. Please be sure to reach out to sponsors@incose.net for advertising and sponsorship inquiries.

EVENT SCHEDULE

08 JAN, 2025	INCOSE ENCHANTMENT: REQUIREMENTS: A COMPREHENSIVE OVERVIEW 4:45 PM - 6:00 PM MT
13 JAN, 2025	SE LAB DEMO DAY 005: SAFETY ANALYSIS ACROSS THE SYSTEM ARCHITECTURE WITH ANSYS MEDINI 11:00 AM - 12:00 PM ET
14, 15 JAN, 2025	INCOSE AFIS (FRANCE): 2025 AFIS ANNUAL CONFERENCE JAN 14, 2025 8:30 AM - JAN 15, 2025 5:30 PM ROMANCE STANDARD TIME
14 JAN, 2025	INCOSE LA: 2025 TOWN HALL MEETING 5:30 PM - 8:00 PM PT EL SEGUNDO, CA, USA
15 JAN, 2025	WEBINAR 178: UNLOCKING SEH5E: UPDATES, CERTIFICATION, AND BEYOND 11:00 AM - 12:00 PM ET

01-04 FEB, 2025	INCOSE IW 2025 – SEVILLE SPAIN SEVILLA, SPAIN
10 FEB, 2025	SE LAB DEMO DAY 006: SIMULATION- BASED DIGITAL TWINS WITH ANSYS TWINBUILDER 11:00 AM - 12:00 PM ET
24 FEB, 2025	SE LAB DEMO DAY 007: MODEL AND SIMULATE SYSTEMS AT THE MISSION LEVEL WITH ANSYS STK 11:00 AM - 12:00 PM ET
05-07 MAR, 2025	INCOSE NEW ENGLAND: 2025 COMPLEX ADAPTIVE SYSTEMS CONFERENCE MAR 05, 2025 8:00 AM - MAR 07, 2025 5:00 PM ET CAMBRIDGE, MA, USA
26-31 JUL, 2025	INCOSE’S 35TH ANNUAL INTERNATIONAL SYMPOSIUM 2025 JUL 26, 2025 - JUL 31, 2025 OTTAWA, CANADA

Visit incose.org/events for more information.

INCOSE Members Newsletter

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- Q4 2025 Newsletter: 15 November 2025

For further information on submissions and issue themes, visit the INCOSE MarCom website: www.incose.org/marcom

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Who are we?
INCOSE is a 25,000+ member organization of systems engineers and others interested in systems engineering. Its mission is to share, promote, and advance the best of systems engineering from across the globe for the benefit of humanity and the planet. INCOSE charts chapters worldwide, includes a corporate advisory board, and is led by elected officers and directors. All views expressed in this Newsletter are the writers' own and do not reflect the views of INCOSE.

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