Socorro Systems Summit–Collaborative Knowledge Exchange–Oct 28-29, 2016

Co-sponsors: INCOSE Enchantment Chapter and New Mexico Tech Electrical Engineering Department.

Practitioners teaming for knowledge exchange and development on issues of interest – professional development.

Day-1: Choose four from eight ¼-day topic introductions, collaboratively setting objectives for Day-2.
Day-2: Choose two from eight ½-day topic workshops, for developing collective knowledge.

Location: New Mexico Tech (NMT), Socorro, New Mexico – a charming small-community location 60 minutes south of the Albuquerque airport. To maximize participation value, we have topics of current interest confirmed by surveys and interviews, and have selected workshop leaders with collaborative-facilitation skills and familiarity with their topic.

Attendance fee: $100, with UTEP and NMT students admitted free with faculty-advisor registration and workshop topic research completed before attendance, per faculty advisor guidance.

Registration: information is posted here (Library tab at www.incose.org/enchantment).

Workshop Topics:

Objectives: Engaged professional development. Expanded work-relevant network. New knowledge to take home. A stimulating time-out from deadline driven work that leaves little time for thinking.

Intent: Understand problem and solution spaces of the topic area better—barriers to solution, cultural incompatibility and push back, systemic inertia, misaligned forces, and solution value propositions, objectives, and requirements.

- **Systems engineering cultural transformation**—A systems engineering culture is an umbrella of shared values and behaviors that transcends the individual cultures of teams, departments, and disciplines—rooted in the appreciation of overarching system concepts and system relationships. What impedes a compelling draw toward the recognition and realization of value here? What is required for an effective transformation?
- **Systems engineering as multidiscipline enabler, art, and science**—Systems engineering has migrated to an engineering procedure and project management based discipline. How can we raise awareness and understanding to a systems level?
- **High performance teaming**—A high-performance team is a group of people committed to a common purpose, showing high levels of collaboration and innovation. Why isn't this a compelling behavior that sucks all of us in naturally? What stands in the way? What requirements are needed to enable and facilitate a natural attraction to high performance teaming?
- **Systems of Systems evolutionary integrity**—Systems-of-systems evolve as individual systems change. What are the requirements for maintaining SoS integrity with asynchronous and self-serving system evolution?
- **Fail-fast rapid innovation concepts**—How do we enable and facilitate innovative experimentation, driven by a focus on fast discovery of insufficiency or inadequacy? What is the compelling value proposition for budgeting and scheduling innovation experimentation? How can experimentation be managed for fail-fast discovery, and appreciated for value?
- **Agile security adaptable to adversary attack evolution**—What are the requirements for system and security strategy that will enable response with at least the agility of the adversary? What are implications for architecture, design, and ConOps?
- **Agile hardware-development infrastructure and ConOps**—How can hardware development infrastructures enable and facilitate asynchronous unit testing and safe, rapid design change? Software uses an infrastructure of object-oriented development platforms and loosely-coupled web-page linkage. What are infrastructure requirements for equivalent hardware capability?
- **Organizational teaming for Joint project pursuit**—What impedes discovery and appreciation of opportunities for working together among organizations, what is required to break down these impediments, and what can be done about them?

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Keynote Speaker: INCOSE President-Elect Garry Roedler will be a featured keynote speaker and attend throughout.

Day 1: Speed dating. Workshop leaders will provide an intro to their topic of about 1.5 hours each. Participants can attend four intros in the time allowed. During this 1.5 hour intro the leader will provide some background on the topic "issues" of workshop interest, limited to only a few issues for focus; outlining what is beyond best practice knowledge and generally accepted knowledge, and worthy of collaborative discussion. Leaders will also get each participant to provide a brief statement of their personal and organization's interest and experience in the area, and their interest in the issues to be discussed. The session will conclude with objectives for the 2nd day workshop – which won't be to solve the issues, but rather to share knowledge and experience that will cross pollinate everybody's thinking. This will prepare all who remain interested for a more in-depth exploration on day-2, who will likely be contributing to the collaboration as a mission-driven team, and what is held collectively as general perspectives.

Day 2: Two dance dates. Participants will choose the two 3-hour workshops they will participate in, one in the morning and one in the afternoon, which don't have to be among the four intros they attended on day-1. The objective of day-2 is to develop a team-work environment, expose each participant to the thinking, practices, and knowledge of the others, and provide new contacts that can become longer term collaborative relationships. An equal objective is to have the workshop identify a clearer understanding of the problem, concepts, and knowledge that surfaces in the workshop – which will be briefed out in general session to all event participants.

A meet-and-greet reception at end of day-1 will help people socialize with new contacts. On-your-own group dinners after the reception will be facilitated, encouraged to include new contacts and not just who brung you.

An optional dinner gathering, Empowering Women as Leaders in Systems Engineering (EWLSE), will be held after the meet-and-greet reception, at the Socorro Springs Brewery. $15.00 ticket for all who wish to attend.

Value Proposition for Personal and Organizational Participation

The knowledge base is exploding. The duration of value for any given piece of knowledge is shrinking as new knowledge makes old knowledge obsolete faster. This puts pressure on the speed of knowledge diffusion and a focus on the anticipation of new knowledge needs. When an organization needs to learn quicker it must shorten the time of knowledge acquisition.

Teaching is a push perspective, learning is a pull perspective. Effective learning is amplified when conducted as a team sport, among people driven by curiosity and a deep-felt need to know something more – a specific something. Collaborative-learning workshops choose topics screened for real appeal to real practitioners – who have a real application for the results. Self-selected participation brings passionate questions and diverse perspectives, and nobody falls asleep. Collaborative learning is aided when topics do not have a clear established knowledge base, and when participants cannot claim dominant expertise. This is the basis for the October 28-29 Socorro Systems Summit.

Communities of practice, defined as "people bound by informal relationships who share a common practice," are another very important collaborative learning mechanism. Communities of practice are fluid and interpenetrative rather than bounded, crossing internal and external organizational boundaries. A community of practice emerges when people with similar interests seek each other for discourse, experience sharing, and problem solving assistance.

Collaborative learning is an effective mechanism for knowledge agenda fulfillment, knowledge diffusion, collaborative culture initiation, and community of practice formation. Communities of practice are an effective mechanism for nurturing a collaborative culture and increasing the velocity and richness of knowledge diffusion.

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It isn't the expectation to solve issues here, as the issues to be discussed are necessarily open and insufficiently understood; but rather to increase the knowledge and idea base of all participants, exposed in a working environment with other people that may become professional colleagues with similar inquisitive interests. This event is for thinking people that recognize vexing issues worthy of attention, and not expecting quick answers, though some will likely surface for people who get ideas from others for immediately application.

The INCOSE Enchantment Chapter (New Mexico and El Paso, TX) has a mission to support Systems Engineering needs and membership professional development and engagement. To this end the Systems Engineering 2-day multi-workshop event is taking place October 28-29, in Socorro, New Mexico, at New Mexico Institute of Mining and Technology (NM Tech). Participation is open to all with interest, and is being promoted INCOSE-wide.

These workshops will not be tutorials, but rather working sessions on topics that can benefit from collaborative thought by people interested in learning more about what others know and think. The objective is to increase the knowledge base of participants wrestling with issues at work, that can benefit from broader exposure to what others with similar issues and interests have experienced, are thinking, and know.

After polling members and their organizations we have chosen the eight topics shown above, ones intended to inspire you and others in your organization to attend and participate. Workshop leadership selection was done INCOSE-wide, favoring people with facilitation skills for eliciting collaborative participation, over depth of subject matter expertise, though familiarity with and interest in the topic is necessary. Workshop leaders will open their workshop with appropriate positioning and background on the topic to focus subsequent collaborative discussion, and guide the effort toward meaningful knowledge sharing and development.

New Mexico Tech

Founded in 1889 as the New Mexico School of Mines, the New Mexico Institute of Mining and Technology (aka New Mexico Tech - NMT) is today a doctoral degree granting public institution focusing on science and engineering. The campus is located in Socorro, New Mexico, a town in the Rio Grande valley. Albuquerque is a little over an hour to the north. New Mexico Tech wins high marks for its value and the salaries of its graduates. Students can choose from 23 majors, and among undergraduates, mechanical and electrical engineering are the most popular. Academics are supported by a healthy 11 to 1 student / faculty ratio. Students at both the undergraduate and graduate levels have exceptional research opportunities because of the institute's numerous affiliated science and engineering research centers.