



Systems Science Working Group Agenda

Saturday, January 29th

Room TBD

Session #	Topic	Presenter	Start Time	End Time	Total Time
1a	Welcome to SSWG	Javier Calvo and James Martin	10:30 AM	11:30 AM	1:00
	Objective:	Introduce the Systems Science Working Group goals, schedule and objectives for IW2022.			
	LUNCH		12:00 PM	1:00 PM	1:00
1b	Systems Science and Enterprise Systems	Javier Calvo, James Martin and Tom McDermott	1:00 PM	3:00 PM	2:00
	Objective:	<p>Identify key issues facing enterprises that can be explored and improved through systems science perspective.</p> <ol style="list-style-type: none"> 1. Introduce ES and SS WGs collaboration goals and meeting purpose (30 minutes) 2. Identify three problems that enterprises are facing that could be alleviated with the development and/or assistance of a systems theory (90 minutes). 			
	BREAK		3:00 PM	3:30 PM	0:30
1c	Future of Systems Science	George Mobus	3:30 PM	5:00 PM	1:30
	Objective:	<p>Explore Systems Science as an integration of Theory, Analysis, Modeling, and Design. This is a new approach to gaining deep understanding of complex systems, including those involving humans. The approach starts with an ontological stance and proceeds to unfold a complete epistemology based on principles of systemness.</p> <p>Geroge Mobus is President of the International Society for the Systems Sciences</p>			
			Total Time		6:00



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Sunday, January 30th
Room TBD

Session #	Topic	Presenter	Start Time	End Time	Total Time
2a	Systems Science and Natural Systems	Javier Calvo and Curt McNamara	9:00 AM	12:00 PM	3:00
	Objective:	<ol style="list-style-type: none"> 1. Introduce NS and SS WGs collaboration goals and meeting purpose (60 minutes) 2. Identify three principles, laws, theories, concepts, methods, or tools for which we have good understanding on how they function and are great candidates to be generalized with systems theory. <ol style="list-style-type: none"> a. The session will follow a nominal group technique type discussion where small groups will work to identify their top three options. b. Then as a larger group we will discuss to identify the best three candidates amongst all. 			
	LUNCH		12:00 PM	1:00 PM	1:00
2b	Category Theory	Complex Systems WG, Systems Science WG, NIST	1:00 PM	3:00 PM	2:00
	Objective:	Introduction on Category Theory for Systems Engineering			
	BREAK		3:00 PM	3:30 PM	0:30
2c	Category Theory Discussion	Complex Systems WG, Systems Science WG, NIST	3:30 PM	5:00 PM	1:30
	Objective:	Discussion on Category Theory for Systems Engineering			
				Total Time	8:00

Monday, January 31st
Room TBD

Session #	Topic	Presenter	Start Time	End Time	Total Time
3a	SE Principles and Heuristics	David Rousseau	9:00 AM	10:00 AM	1:00
	Objective:	SE has many “guiding propositions”, variously called heuristics, principles, axioms, tenets, elementary assumptions, basic rules, fundamental truths, hypotheses, etc. These terms are not clearly defined and often used interchangeably. This workshop will present a model of how such ‘guidelines’ originate, how they relate to each other, and how they evolve to enhance the capability of SE. It will argue that the ultimate evolutionary aim of SE principles is to support design elegance, holistic responsibility and transdisciplinarity based on universal systems patterns. The workshop will outline the processes and stages by which this could be achieved. (1 hour – 25 mins presentation, 35 mins discussion)			
3b	Transdisciplinary Systems Engineering	Michael Pennotti, David Rousseau, Peter Brook	10:00 AM	12:00 PM	2:00
	Objective:	Current SE is largely based on heuristics, which encode ‘best practice’, i.e. lessons learned from past experience. However, we are now entering the Fourth Industrial Revolution, and seeing the emergence of “Industry 4.0” and “Society 5.0”. The future we are entering has no precedent, and hence there is no ‘best practice’ for dealing with its challenges. Going forward, current SE heuristics might be increasingly ineffective. To ensure the future relevance and value of SE, we have to find a way to base SE more on principles and less on heuristics. In this workshop the INCOSE FuSE “Bridge Team” will present a model of the nature of SE that shows how the focus of our conversation about the future of SE has to shift to ensure we evolve to deliver the elegant solutions, holistic accountability, and transdisciplinary inclusiveness that will be required of a relevant future SE. (2 hours – 1 hour presentation, 1 hr discussion)			
LUNCH			12:00 PM	1:00 PM	1:00
3c	Critical Systems Thinking and Practice	Mike C. Jackson	1:00 PM	3:00 PM	2:00
	Objective:	Extending the Scope of Application of Systems Engineering to Complex Sociotechnical Systems through discussing 3 possible ways in which SE might realise this ambition: <ol style="list-style-type: none"> 1. Carry on as before 2. Seek 'scientific foundations' in systems science 3. Enhance SE drawing upon the findings of critical systems thinking 			
				Total Time	8:00



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Monday, January 31st

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Session #	Topic	Presenter	Start Time	End Time	Total Time
3d	AI and ISO 15288	Gary Smith	1:00 PM	3:00 PM	2:00
	Objective:	<p>AI as an adjunct to the Human Activity System - addressing the VUCA gap in a system science context</p> <p>The complexity and complicatedness of our world is escaping our ability to comprehend, work, interact, and live successfully within it. VUCA (Volatility, Uncertainty, Complexity and Ambiguity) abounds in our society and the systems we have to deal with.</p> <p>This session will explore the mapping of postulated AI principles[1] in the support of the human activity system and the ISO15288 system engineering processes. All presented in the context of a framework[2] derived from holarchy and relational theory.</p>			
				Total Time	8:00