

## Table of Contents

Logos of Sponsors and Affiliated Organizations .....	2
Welcome Message, Prof. John Kineman, ISSS President.....	3
Inaugural Message, Prof. Krupanidhi, Chair, Vignan ISSS Meeting .....	5
Conference Schedule .....	7
Plenary Speakers .....	27
Explanation Associating Abstracts to Plenaries (Days and Topics).....	49
List of Abstracts .....	51
Plenary Speakers Abstracts .....	63
Paper Session Abstracts .....	69
Workshop Abstracts.....	127
Poster Abstracts .....	139
Author Index .....	145
Keywords Index .....	149
Conference Centre Map and Local Maps.....	156
Vignan University, India, Day 2 and 3 (22, 23 July) Programme Streaming to Boulder .....	158
Sponsors Information.....	160

# LOGOS OF SPONSORS ISSS2016



# Welcome to ISSS 2016

## 60<sup>th</sup> Annual Conference and Meeting

of the International Society for the Systems Sciences

**Realizing Sustainable Futures  
in Socio-Ecological Systems**  
ISSS-2016 Boulder, Colorado, July 24-30

Dear ISSS and collaborating members, speakers, authors and visitors:

Welcome to ISSS-2016 Boulder, which is being held in conjunction with many collaborating organizations, and with special public programs sponsored by the *WILD Foundation*, the *Center for Process Studies*, and the international *Future Earth* program, perhaps setting a precedent in outreach. We have also partnered with Vignan's University in India to have a twin conference venue. The India program is equally impressive in its focus and design for promoting sustainable systems. While the USA conference will focus more on systemic thinking and transformation on scientific, technical, political, and ethical levels, the India conference focuses on leadership in applying systems thinking for positive development and evolutionary change. Both conferences recognize a fundamental diversity of essential aspects of a balanced, whole system – giving a scientific, systemic meaning to the popular phrase: “unity in diversity”.

In this Conference we have significantly increased our connection and collaboration with other groups to build stronger relationships between human and natural system fields. The Conference theme is a very positive and optimistic one, like last year, expressing the idea that we can indeed achieve global systemic sustainability. However, collaboration is essential to achieve that goal, and we have to remove past impediments. I personally believe that ISSS and its affiliated organizations have the right skills for these times, and that we are at the right place in human history to apply them.

This year we will complete our 60<sup>th</sup> year of ISSS conferences, an anniversary that has special significance in Indian tradition, where the 60<sup>th</sup> anniversary (start of the 61<sup>st</sup> year) is celebrated as the point of transition from one's immediate concerns of career and family to the concerns of humanity and nature, within the greater context of the universe. We will honor this tradition with an ancient ceremony, symbolizing our coming of age and responsibility; and by “walking the talk” through East-West collaboration.

### ***The Conference Focus***

Continuing ISSS' exploration of *The Anthropocene* from last year's amazing conference in Berlin, we now turn our attention to building relationships to realize sustainable systems in the future of the Anthropocene, through a balanced consideration of human and natural systems that we have traditionally treated separately. The task may seem incredibly complicated to most people trained to see the world through the lens of diverse phenomena; but our emerging understanding of systemic complexity, which will likely characterize the next Century of scientific and social thinking, suggests a number of avenues for finding or creating order in that diversity. Our focus in this conference is on how to get there – what are the “next steps”, especially steps that will empower the next

generation. It is clear that Vision and genuine optimism about the future must come first; but it is equally clear that such enthusiasm must also be followed with genuine advances in science, policy, and praxis that incorporate new norms and a more expanded view of complex reality.

While mysteries abound in this effort, we must remember that we have 60 years of experience developing important methods, theories, praxis, and paradigms. That is a 60-year head start at a time when the world is suddenly awakening to the critical need for new approaches to deal with global human dominance of our hyper-complex relation with nature. The prospect of being suddenly in charge of such a system that has run itself effectively for 4.5 billion years, producing us, is certainly daunting: It challenges us to refine every skill we have and to innovate new capacity.

Indeed, even with numerous head starts in many disciplines, modern humanity is struggling to realize the capacity to live systemically and sustainably. The state of the world is clear evidence of that at a time when Calls are increasing for “Ecological Civilization”. The “next step” is therefore to identify and remove whatever impediments have been in place to prevent conceptual and practical progress despite many significant advances in systems thinking; to re-educate ourselves in new, more appropriate thinking and methods. For me this means a serious attempt to establish a working concept of wholeness. Without it we cannot really consider systemic sustainability except to hope that it will emerge as we rearrange the furniture.

For the above reason we have placed a strong emphasis in this conference on transforming Science and Education; Science to see a bigger picture and Education to explore new possibilities. One truly heartening trend today is the enthusiastic and rapid development of *Sustainability Science* and a genuine shift in mainstream thinking toward modern but healthy re-integration of humanity and nature. This is no longer a fringe agenda, but central policy of most governments and international bodies. What we lack, however, is systemic capacity – the very things ISSS has been working on for 60 years. That is the reason I believe this year is the right time to re-connect with groups we may have had to distance from in the past in order to explore new ideas; because now those ideas are needed and wanted.

Day 1 of the conference will glimpse a vision of the future and pathways leading toward it, particularly emphasizing innovation (going beyond repair) and the educational needs for a new agenda in “Systems Literacy”. Indeed, if we are to “change the game” as Gunter Pauli will emphasize in the first Keynote, we have to allow our students and emerging professionals to explore new ideas creatively and without past restrictions. We have to remove the taboo against “holistic” ideas and actively support research and development of holistic science and technology. These are not out-of-reach goals.

### ***The Conference Design***

A quick look at the program may give the impression of considerable diversity in the topics, which is a correct perception. However, there is also a unifying organization intended in the main conference themes, with specific outcome goals. Whether we will come to understand that unity or not is a matter for the conference itself to decide. The daily

program is designed around a null hypothesis, if you will, of five essential aspects of systems thinking, similar to the five aspects identified last year. These are:

Day 1: Vision

Day 2: Scientific knowledge

Day 3: Socio-cultural knowledge

Day 4: Putting theory into practice.

Day 5: All four of the above in relation (holistic synthesis)

I ask that we each keep this organization in mind as we explore the necessary dimensions for systemic sustainability throughout the week. Similarly, we should consider five outcome goals corresponding to the above template. These are:

- Innovation and future-driven paradigms
- Ways to advance Sustainability Science via complex systems thinking
- Policy recommendations for advancing systems research and management
- Priorities for developing General System Theory and praxis
- An agenda for the future of “Systems Literacy” education and outreach

Finally, I want to express my own passion for the subject we are addressing, which was kindled when I was 9 years old in Baltimore. We lived on the edge of an oak forest that was magical and, to me, infinite; until one day we watched as bulldozers transformed our universe. What once held awesome majesty and magic became defined by human control. My brother and I stared in disbelief. Then threw stones at the well-manicured houses. That was the wrong response, but we now know that kind of control is a myth – it is ultimately self-defeating. The grand challenge we face today is to re-engage with the complexity of nature, to appreciate and expand its natural wonder, to discover and innovate new and unheard of realities by working with and by natural principles. We have to recapture the infinite forest that is both wise and whole; that represents infinite possibility and that throughout history and art has been the source of human imagination and true prosperity of the human spirit. Thus I would like to issue a personal challenge: Take the first critical step of embracing an infinite future, and then remove the blocks to realizing that future.

Thank you. Please enjoy the conference!



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*John J. Kineman, ISSS President (2015-2016)*

# Inaugural Address

## Leadership for Sustainable Socio-Ecological Systems

Vignan's University, Vadlamudi, 23-25 July, 2016

The Venue at Vignan's University for this international conference on "Leadership for sustainable socio-ecological systems" is a parallel meet with that of "Realizing Sustainable Futures in Socio-Ecological Systems" going on at University of Colorado, Boulder. Both these Indo-US meets come under the umbrella of International Society for the System Sciences. This society was initiated in 1954 by a group of biologists, economists and mathematicians at the Stanford Centre for Advanced Study in the Behavioral Sciences. Until now ISSS witnessed 54 Presidents and 18 annual meets were conducted. The current president Prof. John J Kineman **called on** our beloved Founder and Chairman of Vignan's Group of institutions Dr. Lavu Rathaiah garu and offered to host annual meet at Vignans' campus. That is the genesis for our congregation now at Sangmam seminar hall.

Human beings are undoubtedly gregarious like birds and insects and live only in societies and never in solitude. Since the time immemorial our society inevitably embraced complex systems - of course – the intensity of complexities is gradually at its upsurge decade after decade. The Classical single discipline and linear thinking approaches are no more adequate to solve complex socio-economic and managerial challenges. Therefore, the present generation is imposing on the requirement of technical level awareness, knowledge of systems approaches and tools – to integrate and extract the concepts from each of the disciplines to solve the complexities and crises.

Biological systems are endowed with a complex metabolic network. Diabetes, Atherosclerosis, Gout, Alzheimer's, etc., are undoubtedly metabolic syndromes. That is, the lacunae in the complexities of metabolic networks led to the development of the present day sustainable management of risk in complex metabolic networks. The tools and concepts of systems design and complexity management would be of immense value, for example, in counteracting health risks and maintaining adaptability in socio-ecological systems.

In this line, we are glad to have amidst us the stalwarts in the field of System Science thinkers namely Prof. Ockie Bosch (Adelaide), Dr. Nam Nguyen (Switzerland), Dr. Leonei Solomons (Sri Lanka), Prof Jan Hendrik Hofmeyr (South Africa), Dr. Gary Jacob (USA now currently at Pondicherry), Dr. Clemencia Morales (Columbia), Dr. Hameed Khan (Maryland, USA), Dr. Andreas Udbye, (Washington, USA) and Dr. MGPL Narayana garu, Vice President, TCS, Hyderabad.

About 6 technical sessions and one demonstration of the Ecopolicy Sensitivity model by Dr. Nam Nguyen and yet another demonstration of Yoga for sustainable health by Mr. M P Sandeep, Sivananda Meenakshi Ashram, Madurai are conceived in the present conference to appreciate the need, the tools and the system concepts to approach the various dimensions of socio-ecological complexities.

With this I conclude, wishing you all a comfortable stay at Vignan's Campus and welcoming you all again to revisit our campus at your convenience as this is one of the best platforms to percolate the tools and concepts in sustainable systems being endowed with the system of technical education. Lastly, I take this opportunity to acknowledge the help and support rendered by Vignan's University in hosting ISSS conference.

Professor Sriram Krupanichi,  
Head, Dept.of Biotechnology

## Conference Program and Schedule ISSS 2016

### PROGRAMME NOTES:

There are codes on each paper this year. The day refers to the plenaries on Monday through Friday of the morning programme. The topics refer to the content, and a document explaining the topics is included in this programme before the list of Abstracts.

The bold 4-digit number is the abstract number you can use to locate the full abstract in this book, and if there is a 4-digit number following that (in parentheses) that number indicates there is a full paper available published online in [www.journals.iss.org](http://www.journals.iss.org)

There are also lists of Abstracts, Keywords and Authors in this programme book. If you have any questions regarding locating sessions, please check Sched.org or come to ask at the Registration Desk.

### Pre-Conference Program (Boulder)

*21 July (Thursday evening):*

Start of Conference in India – Vignan University

16:00 – 21:00 **STiP** (grad course) **Student Welcome**

Instruction starts Friday before the conference, and continues through the Saturday after the conference. There are also Pre-conference and Post-conference assignments.

Chairs: Ray Ison, Peter Tuddenham, Gary Metcalf, Jeremiah Osborne-Gowey, Mary Edson.

*22 July (Friday):*

9:00 – 17:00 **Student Program**

**Main Classroom:** Baker W112

**Break-out rooms:** ECCR 131, 139

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*23 July (Saturday):*

9:00 – 17:00 **Student Program**

18:00 – 20:00 **ISSS Board Meeting** (Taj Restaurant Basemar: 2630 Baseline; 303-494-5216)

## Sunday: July 24, 2016

### Registration, Pre-Conference Workshops and Evening Reception

**REGISTRATION DESK OPEN 08:00 – 17:30 (Lobby, Engineering Building, UC Boulder)**

**07:15 to 08:15 ISSS Global RoundTable—ECCR 139 AND 9:00 -18:00 Delayed Video Broadcast from India (Math 100)**

10:00 – 17:00 Pre-conference Workshops Full Day		
1.	<b>Day IV: Topic(s) 8</b> <b>2932 Tutorial: Systems Processes Theory as a GST, Prototype Systems Science, and Knowledge Base for Systems Engineering &amp; Sustainability, Troncale, L. R.</b>	ECCR200
10:00 – 12:30 Pre-conference Workshops Morning Only		
2.	<b>Day I, II, III: Topic(s) 2, 3, 6</b> <b>2865 Systems Basics in Understanding System Wholeness "Reuniting Nature and Humanity": The Oriental Systems Thinking In the Teaching of Buddha. 系統論基礎工作坊之一：佛學的東方系統思維 - 以天人合一理解系統完整性 Wong, Thomas S L; Huang, E C Yan</b>	ECCR 1B51
14:00 – 17:00 Pre-Conference Workshops Afternoon Only		
3.	<b>2849 Workshop Day IV: Topic(s) 7</b> Introduction to Spiral Dynamics Integral, <i>Levi, Ben</i>	ECCR 151
4.	<b>2948 Workshop Day IV: Topic(s) 8</b> Living Systems Analysis Workshop, <i>Simms, Jim</i>	ECCR 1B55
5.	<b>2735 Workshop Day IV: Topic(s) 7</b> Designing Digital Services: Unifying Information Systems Design and Service Systems Design <i>Kumar, Anand; Lokku, Doji Samson; Zope, Nikhil</i>	ECCR245
6.	<b>2930 Workshop Day III: Topic(s) 6</b> Multicultural World Views on Sustainability, <i>Surel, Dominique; Gupta, Vijay K.</i>	ECCR265
7.	<b>2866 Workshop Day I, II, III: Topic(s) 2, 3, 6</b> Systems Basics in Understanding System Wholeness "Reuniting Nature and Humanity": The Oriental Systems Thinking In Traditional Chinese Medicine, <i>Wong, Thomas S L; Huang, E C Yan</i>	ECCR 1B51
18:00 – 20:00 Reception		
<b>18:00 to 18:30 60<sup>th</sup> Anniversary Ceremony – Visual Arts Complex (VAC) Plaza</b> <b>18:30 to 20:30 Evening Reception in University Memorial Hall (UMC) South Terrace and Tent</b> <b>19:30 to 20:30 US-India RoundTable II (Chair: Sue Gabriele)</b>		



## Monday: July 25, 2016

### Systems Thinking for Systemic Sustainability

REGISTRATION DESK OPEN 07:45 – 12:00 (Lobby, Maths 100); 13:30 to 17:00 Lobby, Engineering Building.  
07:15 to 08:15 ISSS RoundTable Discussion (Treehouse Room, C4C Dining Room)

#### 08:30 Plenary Session (Maths 100 Lecture Theatre)

<b>08:30</b>	<p><b>Plenary I – <i>The Challenge of System(s) Sustainability</i></b></p> <p><i>Description:</i> This year's conference focuses on what it means for a <u>system</u> to be sustainable ("systemic sustainability"): exploring more holistic science and thinking to understand, manage, and create sustainability in complex socio-ecological systems. We are intentionally stepping outside traditional comfort zones to explore new territory and possibly find new answers. For this we recognize the importance of empowering students; removing philosophical and institutional blocks to their inquiry into such questions, and providing them with the best tools to guide their research and practical experiences. From development of new theories and practices to integration of existing ones, our challenge is to determine what will lead society into the transformations needed for a sustainable future and beyond to even greater symbiotic and innovative opportunities; and how we as a society can help initiate those changes.</p> <p><b>Chair:</b> John Kineman</p> <p><b>Speakers:</b></p> <p><b>Opening:</b></p> <p><b>8:30 Jennifer Wilby</b> – <i>Opening announcements</i></p> <p><b>8:35 John Kineman</b> – <i>Conference Program: Realizing Sustainable Futures</i></p> <p><b>Keynotes</b> (times include Q&amp;A):</p> <p>8:55 – 9:35 <b>Gunter Pauli</b> – <i>The Blue Economy: How innovations in technologies and business models set new rules for sustainability.</i></p> <p>9:35 – 10:15 <b>Peter Tuddenham</b> – <i>Systems Literacy Education Goals</i></p>
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#### 10:15 – 10:30 Tea/Coffee (Maths 100 Courtyard)

<b>10:30</b>	<p><b>Plenary II – <i>Towards Holistic Systems Thinking</i></b></p> <p><i>Description:</i> Although every environmental agency today is calling for ways to manage whole ecosystems, we do not know how to do that. Our theories and methods to address the question of whole-system sustainability are incomplete and as a result our actions regarding individual processes, sectors, and resources can contribute to problems as much or more than to solutions. How can systems thinking help us move to another level of understanding where we can address the pressing complex systemic issues of inter-related socio-ecological systems to resolve the dysfunction of their often contradictory sectors and components?</p> <p><b>Chair:</b> Judith Rosen</p> <p><b>Speakers:</b></p> <p>10:30 – 11:15 <b>Judith Rosen</b> – <i>What The Science of Anticipatory Systems Can Illuminate about Science Itself.</i></p> <p>11:15 – 11:45 <b>David Rousseau</b> – <i>Scientific principles for a general theory of whole systems.</i></p> <p>11:45 – 12:15 <b>Shankar Sankaran</b> – <i>Think Hard! Act Soft!.</i></p>
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#### 12:15 Lunch (C4C Cafeteria – included in meal cards)

Paper Sessions 13:30 – 15:00						
Engineering Room ECCR151	Engineering Room ECCR200	Engineering Room ECCR245	Engineering Room ECCR265	Engineering Room ECCR 1B51	Engineering Room ECCR 1B55	Benson 180
<b>SABI: Dialogue in Systems Applications in Business and Industry</b>	<b>Socio-Ecological Systems</b>	<b>Designing Educational Systems</b>	<b>Foundation of Information Science</b>	<b>Systemic Approaches to Conflict and Crises</b>	<b>Critical Systems Theory and Practice</b>	<b>Discussion</b>
<b>Chair: Louis Klein</b>	<b>Chair: Stefan Blachfellner</b>	<b>Chair: Ockie Bosch</b>	<b>Chair: Anand Kumar</b>	<b>Chair: Gerhard Chroust</b>	<b>Chair: Jennifer Wilby</b>	<b>Chair: Mary Edson</b>
<p><b>2776</b> <b>Day IV: Topic(s) 7</b> Industrial Ecology in Motion: A Theoretical Proposal for Innovation on SME's <i>Acero López, Andrés Esteban</i></p> <p><b>2808 (2821)</b> <b>Day IV: Topic(s) 7</b> New Strategies for the Mexican Petrochemical Industry <i>Villarreal, Elvira Avalos; Leon Vega, Cirilo Gabino</i></p> <p><b>2832 (2911)</b> <b>Day IV: Topic(s) 7</b> Using Viable System Model for Chinese Outbound Tourist Market Sustainability <i>Arenas-Resendiz, Tanya; Tejeida-Padilla, Ricardo; Morales-Matamoros, Oswaldo; Coria-Paez, Ana Lilia; Sanchez-García, Jacqueline Yvette</i></p>	<p><b>2724 (2906)</b> <b>Day II: Topic(s) 3, 4</b> Systems Thinking and Wildland Fire Management <i>Thompson, Matthew P; Dunn, Christopher J; Calkin, David E</i></p> <p><b>2758</b> <b>Day I: Topic(s) 1, 2</b> The Holistic Values of Socio-Ecological Systems and the Practice of Green Development In China <i>Fan, Dongping; Fu, Qiang</i></p> <p><b>2862 (2891)</b> <b>Day I, II: Topic(s) 2, 3</b> Framing a System <i>Fables, Ioven</i></p>	<p><b>2814</b> <b>Day I: Topic(s) 1</b> From Systemystery to Systemastery - A Toolbox for Developing Systemtry <i>Daniel Allegro, Brigitte; Smith, Gary Robert</i></p> <p><b>Day III, V: Topic(s) 6, 9</b> Outdoor Adolescent Rites of Passages: Theoretical Foundations, Contemporary Shortcomings, and the Emerging New Model <i>Dooley-Feldman, Eric Adam</i></p>	<p><b>2818</b> <b>Day I: Topic(s) 1, 2</b> On the Information Processing Aspect of the Evolutionary Process <i>Kampfner, Roberto R</i></p> <p><b>2845</b> <b>Day IV: Topic(s) 7</b> Architecture of a Systems Modelling Platform <i>Kumar, Anand; Nori, Kesav Vithal</i></p>	<p><b>2754 (2854)</b> <b>Day I, II: Topic(s) 2, 3,4</b> Developing an Understanding of Violence using the DSRP Theory as a Framework <i>Macgill, Victor R D</i></p> <p><b>2787 (2857)</b> <b>Day II: Topic(s) 4</b> Anticipation and Systems Thinking: A Key to Resilient Systems <i>Chroust, Gerhard; Finlayson, Dennis</i></p> <p><b>2790</b> <b>Day 1, III: Topic(s) 1, 5</b> Sustainability Challenged – Comparing Two Competing Value Systems – What We Found “Shang Jun Shu (The Book By Shang)” From Chin’ Dynasty 2000 Years Ago and the Islamist Ideology Today in Common <i>Hu, Jason Jixuan; Liu, Zhongjing William</i></p>	<p><b>2799 (2799)</b> <b>Day I, IV: Topic(s) 1, 8</b> The Thinking Space: the Enactment of a Platform for Critical Systems Practice <i>Ortegon M, Maria C; De La Torre, Alvaro Carrizosa</i></p> <p><b>2748</b> <b>Day II: Topic(s) 3, 5, 10</b> Taking Advantage of Systems Thinking to Improve a STEM Project to Promote Regional Development <i>Pinzon-Salcedo, Luis A; Van den Bergue Patiño, Erika; Castaño-Herrera, Angélica María</i></p> <p><b>2755</b> <b>Day I, IV: Topic(s) 2, 7</b> Developing a Systemic Framework for Evaluation Models and their Applications <i>Torres, Maria Alejandra</i></p>	<p><b>2886</b> <b>Day I, V: Topic(s) 2, 10</b> Towards Systems Literacy - The Role of Systems Research</p>

15:00 Tea/Coffee (Engineering Lobby) – Poster Viewing in Engineering Lobby

Paper Sessions 15:30 – 17:00						
Engineering Room ECCR151	Engineering Room ECCR200	Engineering Room ECCR245	Engineering Room ECCR265	Engineering Room ECCR 1B51	Engineering Room ECCR 1B55	Benson 180
<b>SABI: Dialogue in Systems Applications in Business and Industry</b>	<b>Socio-Ecological Systems</b>	<b>Designing Educational Systems</b>	<b>Human Systems Inquiry</b>	<b>Systems Engineering and Service Systems Science</b>	<b>OPEN</b>	<b>Discussion</b>
<b>Chair: Louis Klein</b>	<b>Chair: Stefan Blachfellner</b>	<b>Chair: Ockie Bosch</b>	<b>Chair: Dennis Finlayson</b>	<b>Chair: Anand Kumar</b>		<b>Chair: Mary Edson</b>
<p><b>2834 (2910)</b>  <b>Day IV: Topic(s) 7</b>  A Systemic Approach on Human Resource Management in Tourism Small and Medium Enterprises Considering Socio-Ecological Systems  <i>Núñez-Ríos, Juan E.; Tejeida-Padilla, Ricardo; Badillo-Piña, Isaias; Morales-Matamoro, Oswaldo; Sanchez-García, Jaqueline Yvette; Jarquin-García, Brenda;</i></p> <p><b>2837 (2909)</b>  <b>Day IV: Topic(s) 7</b>  Systemic Complementarity In Micro, Small and Medium Tourist Enterprises Considering the Socio-Ecological System  <i>Sánchez-García, Jacqueline Yvette; Tejeida-Padilla, Ricardo; Moreno-Escobar, Jesus Jaime; Morales-Matamoros, Oswaldo; Nuñez-Ríos, Juan</i></p>	<p><b>2763</b>  <b>Day III: Topic(s) 3, 5</b>  The System of Accounts for Global Entropy Production, (Sage-P): Nonlinear Accounting of Gross Domestic Product (GDP) In the Domain of the Ecosphere, Sociosphere and Econosphere  <i>Friend, Marcus Anthony</i></p> <p><b>2764 (2848)</b>  <b>Day III: Topic(s) 5</b>  An Aggregated Qualitative Accounting Method for Developing Justified Policies  <i>Friend, Michèle</i></p> <p><b>2770</b>  <b>Day I: Topic(s) 1</b>  The Reconstruction of Systems</p>	<p><b>2796</b>  <b>Day IV: Topic(s) 7</b>  Exploring the Phenomenon of Technological Integration in K-12 Classrooms for Education Leaders  <i>Raine, Alice</i></p> <p><b>2879</b>  <b>Day V: Topic(s) 10</b>  A Systems Approach to the Development of Research Capacity: A Case Study of a Systems Practice Masters Programme  <i>Shaw Corrin.,; Le Roux, Kate</i></p> <p><b>2775</b>  <b>Day III: Topic(s) 6</b>  Indigenous Contributions to Sustainability and Systems Education  <i>Morgan, Te Kipa Kēpa; Fa`Aui,</i></p>	<p><b>2767</b>  <b>Day 1, III: Topic(s) 1, 5</b>  Emerging Possibilities: Adapting Carol Sanford's Stakeholder Pentad for the Nonprofit and Public Sectors  <i>Gibbons, Kathleen; Jacobs, Marty</i></p> <p><b>2792</b>  <b>Day I, III: Topic(s) 2, 5, 6</b>  Leadership Practices for Thrivability of Complex Social Systems: Three Stories  <i>Wilson, Patricia A.; Walsh, Elizabeth; Bush, Alan</i></p> <p><b>2803</b>  <b>Day II: Topic(s) 2</b>  Aristotle's Four Causes and Teamwork in Corporations  <i>Kulak, Daryl</i></p>	<p><b>2835 (2940)</b>  <b>Day I, II: Topic(s) 2, 3</b>  Wholeness in Complex Socio-Technical Systems  <i>Toth, William Joseph</i></p> <p><b>Service Systems Science 2844</b>  <b>Day IV: Topic(s) 7</b>  Value Based Architecture of Digital Product-Service Systems  <i>Kumar, Anand; Lokku, Doji Samson; Zope, Nikhil Ravindranath</i></p> <p><b>2742 (2881)</b>  <b>Day I: Topic(s) 1, 2</b>  Performance Evaluation System In Engineering Matters: Systematic and Theoretical Approach to Humanity  <i>Takaku, Tatsumasa</i></p>	<p><b>2886</b>  <b>Day I, V: Topic(s) 2, 10</b>  Towards Systems Literacy - The Role of Systems Research</p>	

<p><i>Enrique; Arenas-Resendiz, Tanya;</i></p> <p><b>2838 (2912)</b>  <b>Day IV: Topic(s) 7</b>          Designing an Accessible Tourism Destination: The Soft System Methodology and the Triple Helix as a Theoretical and Practical Proposal</p> <p><i>Matamoros-Hernández, Omar E.; Tejeida-Padilla, Ricardo; Briones-Juarez, Abraham; Morales-Matamoros, Oswaldo</i></p>	<p>Paradigm: Study on the Idea and Model for Boundary-Balance of Nonlinear Society</p> <p><i>Liu, Yiyu; Yan, Zexian</i></p>	<p><i>Tumanako Ngawhika</i></p>				
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Dinner available at C4C (17:00 to 18:30 self-pay) or nearby local restaurants

19:00 Evening	
<p><b>19:00 – 21:00</b>  <b>Macky Auditorium</b></p>	<p><b>Public Program: <i>Next Steps to Realizing a Sustainable Future</i></b>          (ISSS &amp; the WILD Foundation, Public Event at Macky Auditorium)</p> <p><b>DISCOUNTED TICKETS for ISSS \$10 Available at Registration Desk or at the Door on Evening</b></p> <p><b>Description:</b> As we reach global limits of human growth in many dimensions, advanced thinking is required to operate in ecological balance with nature and to create more symbiotic opportunities. Join us for an informative evening of public talks on anticipating the future of nature and humanity.</p> <p><b>Chair:</b> Amy Lewis</p> <p><b>Panellists:</b>  <b>Gunter Pauli</b> (The Blue Economy); <b>John Fullerton</b> (Regenerative Capitalism); <b>William Becker</b> (Global Change); <b>Marc Bekoff</b> (Life and Human Values); <b>Ilarion Merculieff</b> (Indigenous Wisdom); <b>Jeff Orolowski</b> (Nature Documentary); <b>Joshua Tewksbury</b> (Future Earth Science).</p>

## Tuesday: July 26, 2016

### Global Science and Assessment

REGISTRATION DESK OPEN 07:45 – 12:00 (Lobby, Maths 100); 13:30 to 17:00 Lobby, Engineering Building.  
 07:15 to 08:15 ISSS RoundTable Discussion (Treehouse Room, C4C Dining Room)

#### 08:30 Plenary Session (Maths 100 Lecture Theatre)

08:30	<p><b>Plenary III: <i>Connecting Human and Natural System(s) Research</i></b></p> <p><b>Description:</b> Current ecological trends present a dramatic picture of potentially catastrophic change in the world. At the same time, our human and societal response mechanisms seem poorly designed for coping with complexity, and science seems unable to address systemic problems and systems as a whole. What are the challenges in science, policy, and ethics to become a sustainably healthy civilization with creative options for the future?</p> <p><b>Chair:</b> Jeremiah Osborne-Gowey</p> <p><b>Speakers:</b>        8:30 – 9:00 <b>Carol Wessman</b> (ENVS/CIRES) – <i>Linking Science, Policy, and Ethics in Sustainability Science at the University of Colorado</i>        9:00 - 9:30 <b>Bruce Milne</b> – <i>Sustainability Science</i>        9:30 – 10:00 <b>Joshua Tewksbury</b> – <i>Living in the Anthropocene: Science, Sustainability, and Society</i>        10:00 – 10:15 <b>Q&amp;A</b></p>
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#### 10:15 – 10:30 Tea/Coffee (Maths 100 Courtyard)

10:30	<p><b>Plenary IV: <i>Crisis Science: Anticipatory, Real-Time, and Preventive</i></b></p> <p><b>Description:</b> Adequate resilience and appropriate response (interventions) to crises and disasters and continuous improvement thereof is a growing global need and a social responsibility in view of the seemingly growing number of disasters endangering a growing number of people and even our civilization. Can we do a better job of anticipating, systemically understanding and mitigating the cycles of crisis and recovery by combining exploratory 'crisis science' with long-term 'sustainability science'? Can we unravel the antithesis of incompatible response systems and find new ways to integrate scientific, technological, cultural, ethical, political and economic influences? Preparedness must systemically consider the often emergent interplay of supporting and obstructing factors. Actual interventions (responses) must holistically evaluate the total situation and make decisions, unfortunately to be performed under high uncertainty, extreme stress and time pressure. Despite the often singularity of disasters we have to identify similarities and powerful abstraction in order to support scientific analysis and improved mitigation. A long range target could be an interdisciplinary 'Strategic Crisis Science'. The panel of international experts will discuss these issues from their different backgrounds and national priorities with respect to preparedness and interventions. We will attempt to establish common grounds and basic solutions.</p> <p><b>Chair:</b> Gerhard Chroust</p> <p><b>Speakers:</b>        10:30 <b>Gerhard Chroust</b> - <i>Expecting the unexpected, coping with crisis</i>        10:40 <b>Roberto Poli</b> – <i>Anticipatory Science – Science before the crisis</i>        11:15 <b>James P. Syvitski</b> – <i>From politics to remote sensing: The Indus Flood of 2010 – unfolding of a disaster and lessons learned</i>        11:50 <b>Q&amp;A</b></p>
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#### 12:15 Lunch (C4C Cafeteria included in meal cards)

Paper Sessions 13:30 – 15:00						
Engineering Room ECCR151	Engineering Room ECCR200	Engineering Room ECCR245	Engineering Room ECCR265	Engineering Room ECCR 1B51	Engineering Room ECCR 1B55	Benson 180
<b>Action Research And Balancing Individualism and Collectivism</b>	<b>Human Systems Inquiry</b>	<b>Systems Engineering</b>	<b>Research Toward a General Theory of Systems</b>	<b>Curating Emergence for Thrivability</b>	<b>Organisational Transformation and Social Change</b>	<b>WORKSHOP PART 1</b>
<b>Chair: Shankar Sankaran</b>	<b>Chair: Dennis Finlayson</b>	<b>Chair: Janet Singer</b>	<b>Chair: David Rousseau</b>	<b>Chair: Alexander Laszlo</b>	<b>Chair: Louis Klein</b>	<b>Chair: Len R. Troncale</b>
<p><b>Action Research 2760 (2903)</b>  <b>Day I, IV: Topic(s) 2, 8</b>  Participatory Action-Research as a Methodology for the Development of Appropriate Technologies by Communities  <i>Acero López, Andrés Esteban; Ramírez Cajiao, María Catalina; Mejía, Mauricio Peralta; Payán Durán, Luisa Fernanda; Espinosa Díaz, Edier Ernesto</i></p> <p><b>2797</b>  <b>Day II, III, V: Topic(s) 3, 5, 9</b>  The Urban Village as a Living System: Building a Generative and Caring Local Economy and Society through Strategic Collaboration  <i>Joseph, Brett R.</i></p>	<p><b>2780 (2942)</b>  <b>Day I, II: Topic(s) 2, 3</b>  Ingenieros Sin Fronteras Colombia: Improvement of the Water Quality In the Community of Santa Isabel de Potosí  <i>Ramírez Cajiao, María Catalina; Sanabria Céspedes, Juan Pablo; Duarte Gómez, Diana María; Acero López, Andrés Esteban</i></p> <p><b>2795 (2913)</b>  <b>Day III: Topic(s) 5</b>  Civilization, Technology, and Money: The Challenge of a Human Fit  <i>Kalton, Michael Charles</i></p>	<p><b>2728</b>  <b>Day IV: Topic(s) 7</b>  CONSYS Approach for Building: A Link Between CONOPS and System Models in the Context of Model-Based Systems Engineering  <i>Yang, Sherry; Blessner, Paul; Olson, Bill</i></p> <p><b>2732 (2732)</b>  <b>Day II: Topic(s) 3, 5</b>  Systemic Integration on Spatial Knowledge in Business  <i>Leon Vega, Cirilo Gabino; León Hernández, Ciro David; Reséndiz Vázquez, Rabiendranath</i></p> <p><b>2823 (2823)</b>  <b>Day V: Topic(s) 9</b>  A Systemic Model for Communication Innovation</p>	<p><b>2793</b>  <b>Day I, IV: Topic(s) 1, 2, 8</b>  An Integrative Model of Four-Phase Adaptive Evolution in Organizations  <i>Lin, Kingkong</i></p> <p><b>2807</b>  <b>Day I, IV: Topic(s) 2, 8</b>  Addressing the Whole Whole  <i>Marzolf, Thomas R</i></p> <p><b>BY SKYPE</b>  <b>2744</b>  <b>Day IV: Topic(s) 7,8</b>  Footprints of General Systems Theory  <i>Malecic, Aleksandar</i></p>	<p><b>2740</b>  <b>Day I, V: Topic(s) 1, 2, 10</b>  A Whole Systems Approach to Education Redesign: A Case Study on the Need for Inter-Generational Perspectives and Inclusion  <i>Laszlo, Kahlia Paola; Laszlo, Alexander</i></p> <p><b>2752 (2955)</b>  <b>Day V: Topic(s) 10</b>  Crucial Institutional Innovations: Evolutionary Change in Higher Education  <i>MacVie, Leah</i></p> <p><b>2771</b>  <b>Day I: Topic(s) 1, 2</b>  The Lighthouse - Innovating the Systems Sciences System  <i>Karabeg, Dino; Macvie, Leah; Rudan, Sasha Mile; Rudan, Sinisha; Grathoff, Annette;</i></p>	<p><b>2836</b>  <b>Day I, IV: Topic(s) 1, 2, 7</b>  How Teaching Cybernetics, in any Discipline, Can Bring Forth Systemic Change  <i>Chapman, Jocelyn; McClendon, Karen</i></p> <p><b>2842</b>  <b>Day I, III, IV: Topic(s) 1, 6, 7</b>  The Illusion of Technology: A Generational Perception on the Need for a Human-Centered Approach in Dealing with Developments of Science and Technology  <i>Von Mitschke-Collande, Joséphine; Alvarez Pereira, Carlos</i></p> <p><b>2889</b>  <b>Day IV: Topic(s) 7</b>  A Categorization of Socio-Technical Systems Approaches based on Context and Purpose</p>	<p><b>2934</b>  <b>Day V: Topic(s) 10</b>  \$5m Later ... Assessment of Four Systems Education Programs: What Works, What Doesn't &amp; Why  <i>Troncale, L. R.</i></p>

<b>2843 (2843)</b> <b>Day I, II: Topic(s) 2, 3</b> Critical Systems Thinking Review on Decentralised Drinking Water Management in Nuali City, Indonesia <i>Simbolon, Jackwin</i>	<b>2745 (2893)</b> <b>Day I: Topic(s) 2</b> Typology of Social Actions Based on the Living System Theory <i>Riss, Ilan</i>	<i>Leon Vega, Cirilo          Gabino; Iturri          Hinojosa, Luis          Alejandro; Ávalos          Villareal, Elvira</i>		<i>Laszlo, Alexander;          Hahn, Samuel</i>	<i>Rime, Elatlass,;          Narwankar, Chinmay          Sandeep; Calvo-Amodio,          Javier</i>	
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**15:00 Tea/Coffee (Engineering Lobby) – Poster Viewing in Engineering Lobby**  
**Paper Sessions 15:30 – 17:00**

Engineering Room ECCR151	Engineering Room ECCR200	Engineering Room ECCR245	Engineering Room ECCR265	Engineering Room ECCR 1B51	Engineering Room ECCR 1B55	Benson 180
<b>Action Research and Systems &amp; Mental Health</b>	<b>Systems Philosophy and Critical Systems Theory and Practice</b>	<b>Systemic Approaches to Conflict and Crises</b>	<b>Health and Systems Thinking</b>	<b>Curating Emergence for Thrivability</b>	<b>Organisational Transformation and Social Change</b>	<b>WORKSHOP</b>
<b>Chair: Shankar Sankaran</b>	<b>Chair: David Rousseau</b>	<b>Chair: Gerhard Chroust</b>	<b>Chair: Thomas Wong</b>	<b>Chair: Alexander Laszlo</b>	<b>Chair: Louis Klein</b>	<b>Chair: Mila Popovitch and Alexander Laszlo</b>
<b>2887 (2888)</b> <b>Day V: Topic(s) 9</b> A Communication System for Socio-Ecological Processes <i>Murillo-Sandoval, Sandra Leticia; Peon-Escalante, Ignacio E; Badillo-Piña, Isafas</i>  <b>2777</b> <b>Day V: Topic(s) 9</b> Positive Systems Science: Using Positive Psychology to bring Systems Science to Life <i>Siokou, Christine</i>	<b>2762</b> <b>Day IV: Topic(s) 8</b> Dynamics as Demarcation <i>Silverman, Howard</i>  <b>2884</b> <b>Day III: Topic(s) 5</b> Bringing Forth the Ecological Economy <i>Perkins, Skyler Knox</i>  <b>2895</b> <b>Day IV: Topic(s) 7</b> Complementarist Approach to Categorize	<b>2791</b> <b>Day II, III: Topic(s) 4, 6</b> Comparing the Current ISIS and the (Not Yet) Past Leninist States (USSR and Pre-1979 China) <i>Liu, Zhongjing William; Hu, Jason Jixuan</i>  <b>2872</b> <b>Day III: Topic(s) 5</b> Evolution of Supply Chain Management Towards Green Supply Chain Management: Drivers and their Impact	<b>2800</b> <b>Day II: Topic(s) 3</b> Managing for the Health of Coupled Human and Natural Systems at the Watershed Scale <i>Bunch, Martin Joseph; Morrison, Karen</i>  <b>2813</b> <b>Day IV: Topic(s) 7</b> Architectural Parallels Between Biological and Engineered Solutions in Defence and Security Adaption,	<b>2778 (2935)</b> <b>Day II, V: Topic(s) 3, 10</b> Patterns that Connect: Exploring the Potential of Patterns and Pattern Languages in Systemic Interventions towards Realizing Sustainable Futures <i>Finidori, Helene</i>  <b>2892</b> <b>Day I: Topic(s) 1, 2</b> Analogical Reasoning on Creation <i>Lee, Suehye; Shirasaka, Seiko</i>	<b>2819 (2947)</b> <b>Day I: Topic(s) 1,2</b> Opening the Field of Linguistic Design for Thrivability <i>Roth, Ian</i>  <b>2833 (2874)</b> <b>Day I, III: Topic(s) 1, 5</b> How to Design All Together? The Triple Bottom Line <i>Barrera, Ricardo</i>	<b>Art and Performance</b>

<p><b>2921</b>  <b>Day V: Topic(s) 10</b>          Developing a Theory of Systems Change Approach to Practice-Based Research in a Professional Public Health Doctoral Program  <i>Pinsker, Eve; Welter, Cristina</i></p>	<p>Different Stakeholders within Socio-Technical Systems  <i>Calvo-Amodio, Javier; Narwankar, Chinmay Sandeep; Rime, Elatlassi; Wang, Siqi</i></p>	<p><i>Sami Georges ElNaddaf</i></p>	<p>Anticipation, and Sustainment.  <i>Daniel Allegro, Brigitte; Smith, Gary Robert</i></p> <p><b>2882</b>  <b>Day II, III: Topic(s) 2, 3</b>          Five Elements Systemic Healthcare Program for Physically Strong Emotionally Happy Mentally Kind Behaviorally Charitable and Spiritually Enlightened – Reuniting Nature and Humanity  <i>Wong, Thomas S L; Huang, E C Yan</i></p>	<p><b>2900</b>  <b>Day IV: Topic(s) 7</b>          Unlimited Energy  <i>Crespo, Fabiana</i></p>	<p><b>2898 (2898)</b>  <b>Day III: Topic(s) 6</b>          Transnational Knowledge: Its Creation and Distribution Exploiting Entrepreneurship and Organisational Behaviour  <i>Hilton, Brian John</i></p>	
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Dinner available at C4C (17:00 to 18:30 self-pay) or nearby local restaurants

19:00 Evening

<p>19:00 – 21:00  <b>BENSON 180</b></p>	<p><b>Colloquium: <i>Edge of Science: Thresholds and new paradigms</i></b>  <b>Chairs:</b> Dominique Surel and Pamela Henning  <b>Description:</b> Participatory, real-time science, or holistic science is the heart of the emerging new paradigm of sustainability science and anticipatory science. We can see it exemplified in science conducted during a crisis, which is quite different from disciplinary science in which we are used to knowing the questions and priorities for research. During crises even the questions must be discovered, disciplines must be combined or transcended, and people and institutions must collaborate. We will look at some characteristics of this exploratory edge of science that seems so important for the study of systems. We will also examine social and psychological factors that tend to resist exploratory science, making it difficult to study complex phenomena, crises or impending crises; and thus requiring a special set of personal skills. Today the challenge of complex systems means a great need for new science that can deal with more than traditional causes and mechanisms. This will be an evening of penetrating discussion on three topics (a) the need for an exploratory phase of science, (b) requisite human capacity for systems thinking and (c) peer and institutional resistance to threshold ideas and new paradigms.  <b>Program:</b>          19:15 - 19:45 <b>Gary Machlis</b> - <i>The Distinctive Characteristics of Science during Crisis</i>          19:45 – 20:00 <b>Dominique Surel</b> – <i>Human Capacity for Systems Thinking</i>          20:00 – 20:15 <b>Pamela Henning</b> – <i>Psychology of Empowering and Supporting Student Research</i>          20:15 – 21:00 Facilitated discussion</p>
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## Wednesday July 27, 2016

### Cultural, Ethical, and Economic Wisdom

REGISTRATION DESK OPEN 07:45 – 12:00 (Lobby, Maths 100); 13:30 to 17:00 Lobby, Engineering Building.  
07:15 to 08:15 ISSS RoundTable Discussion (Treehouse Room, C4C Dining Room)

#### 08:30 Plenary Session (Maths 100 Lecture Theatre)

08:30

**Plenary V: Making Sense in Economics, Ethics, and Policy**

*Description:* We need to examine the foundation of our global economic system that assumes unlimited growth in a finite world, to consider the paradigms of regenerative capital, steady-state economics, and innovation. This means considering no-growth and negative-growth models, and perhaps shifting our concept of growth from quantity to quality, from extraction to investment in natural and human capital.

**Chairs:** Alec Tsoucatos and Mila Popovitch

**Speakers:**

8:30 – 9:00 **John Fullerton** – *Reimagining Capitalism: Transitioning to a Regenerative Economy*

9:00 – 9:15 **Alec Tsoucatos** – *The Economics of Care, Wisdom and Empowerment*

9:15 – 10:15 **Mila Popovitch** - *Economics of Dignity and New Economy: Valuing Planet, People and Progress*

9:15 – 10:15 **Panel Discussion**

**Chair:** Mila Popovitch

**Panelists:**

**Elizabeth Kucinich; John Fullerton; Gunter Pauli and Alec Tsoucatos**

#### 10:15 – 10:30 Tea/Coffee (Maths 100 Courtyard)

10:30

**Plenary VI: Multi-Cultural Worldviews on Sustainability**

*Description:* Ancient and native cultures have a direct experiential knowledge of whole systems and what is a sustainable natural balance. What are the lessons and how do we incorporate them into modern science, leadership, and society?

**Chairs:** Dominique Surel and Vijay Gupta

**Panelists:**

**Bruce Milne, Greg Cajete, Jamal Martin, David Begay, Nancy Maraboy and Rudy Miick**

12:15 BROWN BAG LUNCH BOXES PICK UP AT MATH 100 then move to University Memorial Center (UMC) ROOM 235 for Special Lunch Programme (included in meal cards).

**Special Brown Bag Public Program: Inter-Faith Perspectives on Global Sustainability**

**Description:** In the face of unprecedented global change, Pope Francis recently challenged people of all faiths to unite together for what he called "integral ecology." Is his appeal compelling? What of a similar nature has been said in other faith traditions and what is new about this appeal? This interfaith panel discussion on global sustainability will explore a variety of faith perspectives that may contrast or correlate with the Pope's *Laudato Si': On Care for Our Common Home*. Scholars and religious leaders representing diverse faith traditions will engage with one another to discuss the roots and meanings of "integral ecology" and this contemporary call to action.

**Chairs:** Andrew Schwartz and Alec Tsoucatos

**Panellists:**

**Loriliai Biernacki** – Hinduism; **Anne Parker** – Buddhism; **Aun Ali** – Muslim; **Glenn Morris** – Native American  
**Marc Soloway** – Jewish; **Todd Wynward** – Christian; **Venugopal Damerla** and **Manu Raval** – Vedic Tradition; **Larry Goldberg (In Memorium)**

**WORKSHOPS AND FIELD TRIP 13:30 – 15:00**

NCAR is an NSF research facility that studies the global environment and is open to the Public. It is situated next to the Boulder Mountain Park and Mesa Trail. NCAR staff will greet each group and give a short talk about NCAR outside in the natural setting of the Mesa. Visitors are then free to browse the exhibits or walk along the Mesa trail.

<i>NCAR / Mesa Trail</i>	Engineering Room ECCR200	Engineering Room ECCR245	Engineering Room ECCR265	Engineering Room ECCR 1B51	Engineering Room ECCR 1B55	Benson 180
FIELD TRIP	WORKSHOP	WORKSHOP	WORKSHOP	WORKSHOP	OPEN ROOM	POLICY SUMMIT
Register at Conference Desk	Chair: Pavel Luksha	Chair: Eric Dooley-Feldman	Chair: Shankar Sankaran and Pamela Buckle	Chair: Judith Rosen		Chair: Paul Sperry and Alex Tsoucatos
<b>Schedule:</b> (30 persons in each Group; signup at Registration Desk) <b>Group I:</b> 13:30 departure from UMC Building – 15:15 return from NCAR	<b>2937</b> <b>Day V: Topic(s) 10</b> System Literacy and Systemic Innovation for Thrivable Future <i>Laszlo, Alexander; Karobeg, Dino; Luksha, Pavel</i>	<b>2783</b> <b>Day III, V: Topic(s) 6, 9</b> WILD: Wilderness Integration & Life Development: Co-creating the Emerging Model <i>Dooley-Feldman, Eric Adam</i>	<b>2738</b> <b>Day I: Topic(s) 2</b> Developing Capability using a Maturity Profile for Action Research: An International Collaboration <i>Sankaran, Shankar; Rowe, Wendy; Cady, Phil; Pamela Buckle</i>	<b>2949</b> <b>Day IV: Topic(s) 8</b> Anticipatory Systems and Gender Dysphoria <i>Rosen, Judith; Rosen, Donna</i>	observers.	<b>2964</b> Systemic Sustainability Policy – Recommendations of the Systems Sciences Community <i>Sperry, Paul and Tsoucatos, Alex</i>

**15:00 Tea/Coffee (Engineering Lobby) – Poster Viewing in Engineering Lobby**

**Paper Sessions 15:30 – 17:00**

Engineering Room ECCR151	Engineering Room ECCR200	Engineering Room ECCR245	Engineering Room ECCR265	Engineering Room ECCR 1B51	Engineering Room ECCR 1B55	Benson 180
<i>NCAR / Mesa Trail</i>	WORKSHOP	WORKSHOP	WORKSHOP	WORKSHOP	OPEN ROOM	POLICY SUMMIT
Register at Conference Desk	Chair: Dino Karabeg	Chair: Jim Best	Chair: Thomas Wong	Chair: Judith Rosen		Chair: Paul Sperry and Alex Tsoucatos
<b>Schedule:</b> (30 persons in each Group; signup at Registration Desk) <b>Group II:</b> 15:00 departure from Engineering – 16:45 return from NCAR	<b>2946</b> <b>Day V: Topic(s) 10</b> CET SIG Workshop: Collaboration for Impact 2016 <i>Grathoff, Annette; Hahn, Samuel; Karabeg, Dino; Laszlo, Alexander; MacVie, Leah; Rudan, Sasha Mile; Rudan, Sinisha</i>	<b>2784</b> <b>Day V: Topic(s) 9</b> Workshop (90 Minutes): Network Thinking and Liberating Practice for Creating Resilient, Diverse, Communities of Practice that Engage the Whole Person <i>Best, Jim</i>	<b>2905</b> <b>Day I, III: Topic(s) 2, 6</b> System Wholeness and Unity In Diversity within ISSS <i>Wong, Thomas S L</i>	<b>2949</b> <b>Day IV: Topic(s) 8</b> Anticipatory Systems and Gender Dysphoria <i>Rosen, Judith; Rosen, Donna</i>		<b>2964</b> Systemic Sustainability Policy – Recommendations of the Systems Sciences Community <i>Sperry, Paul and Tsoucatos, Alex</i>

17:30 – 18:45 ISSS Council Meeting (C4C Dining Hall) – Self Pay Dinner and Meeting

Dinner available at C4C (17:00 to 18:30 self-pay) or nearby local restaurants

19:00 Evening

19:00 – 21:00  
BENSON 180

Special Evening Dialogue: **Robert M. Hutchins Memorial Dialogue on Anticipating Global Futures**

**Description:** Robert M. Hutchins' dialogues were centered on the idea that systems theory is needed to anticipate the future of human and natural systems and to advance science, governance, societal development, and educational systems. Continuing in the spirit of these dialogues, this will be an open, multi-faceted discussion about issues of sustainability in socio-ecological systems.

**Chairs:** Judith Rosen and Debora Hammond

**Thursday: July 28, 2016**  
**Systems Theory, Management, and Practice**

REGISTRATION DESK OPEN 07:45 – 12:00 (Lobby, Maths 100); 13:30 to 17:00 Lobby, Engineering Building.  
 07:15 to 08:15 ISSS RoundTable Discussion (Treehouse Room, C4C Dining Room)

**08:30 Plenary Session (Maths 100 Lecture Theatre)**

08:30

**Plenary VII: Engineering Sustainable Systems and Technology**

**Description:** To build sustainable and thriving systems, societies, and civilizations we need to combine real-world experience with practical methods in engineering, design, cybernetics, ethical control systems, service systems, and other emerging technological fields such as bioneering and nanotechnology. How do we transcend current limits to realize innovative and entrepreneurial technological possibilities within a sustainability framework?

**Chair:** Gary Smith

**Speakers:**

**8:30 – 9:00 Anand Kumar** - *Reflections on the Tata Sustainability Journey*

**9:00 – 9:30 Rick Dove** - *Enabling and Facilitating Engineered Sustainability*

**9:30 – 10:00 Diana Mann** - *The Global Water Energy Nexus*

**10:00 – 10:15 Discussion**

**10:15 – 10:30 Tea/Coffee (Maths 100 Courtyard)**

10:30

**Plenary VIII: Prospects for Scientific Systemic Synthesis**

**Description:** Recent times have seen the emergence of new theoretical insights that may help to establish the frameworks, theories and methodologies we need to understand, design, build, explain, communicate about, utilize or operate, maintain, and evolve resilient and sustainable socio-ecological systems. In this panel we bring together experts to present on such emerging developments in the areas of engineering, science, research, practice and philosophy, and to reflect on how these different stands can contribute to the formation of a new systemic synthesis that will make the 'whole systems perspective' scientific and practical. The panel presentations will be delivered in the last plenary before lunch, and be followed by an open discussion between the panellists and audience in a break-out session immediately after lunch. **Chair: \*David Rousseau**

**Panellists:**

**10:30 – 10:55 Bill Schindel** - *The S\* minimal general systems meta-model, and its prospects as a general modelling foundation for Systems Engineering.*

**10:55 – 11:20 Len Troncale** - *Systems Processes Theory (SPT) , and its prospects as a general theoretical core for a science of systems and sustainability.*

**11:20 – 11:45 John Kineman** - *The PAR/Holon Relational Framework, and its prospects as a general methodology for Systems Research*

**11:45 – 11:55 Jennifer Wilby** - *Systemic methodologies and the prospects for enhancing them on the basis of emerging general systems theories and models.*

**11:55 – 12:10 David Rousseau** - *Systems Philosophy and the prospects for employing scientific general systems principles as the foundation of a systems worldview.*

**12:10 – 12:15 Q & A**

**12:15 Lunch (C4C Cafeteria included in meal cards)**

Paper Sessions 13:30 – 15:00						
Engineering Room ECCR151	Engineering Room ECCR200	Engineering Room ECCR245	Engineering Room ECCR265	Engineering Room ECCR 1B51	Engineering Room ECCR 1B55	Benson 180
<b>Designing Educational Systems and Hierarchy Theory</b>	<b>Organisational Transformation and Social Change</b>	<b>SABI: Dialogue in Systems Applications in Business and Industry</b>	<b>Socio-Ecological Systems</b>	<b>Human Systems Inquiry</b>	<b>SKYPE PRESENTATIONS</b>	<b>DISCUSSION</b>
<b>Chair: Ockie Bosch</b>	<b>Chair: Louis Klein</b>	<b>Chair: Andreas Hieronymi</b>	<b>Chair: Stefan Blachfellner</b>	<b>Chair: Dennis Finlayson</b>	<b>Chair: Delia Pembrey MacNamara</b>	<b>Chair: David Rousseau</b>
<p><b>2870</b> <b>Day V: Topic(s) 10</b> Transforming to Sustainable Futures: Learning From 45 Years of Systems Thinking In Practice Pedagogy <i>Chris Blackmore,; Ray Ison</i></p> <p><b>2766</b> <b>Day V: Topic(s) 10</b> Agency and Causal Factors in Social Systems: Toward Heightened Learning, Performance, and Connection in our Schools and Workplaces <i>Gabriele, Susan Farr</i></p> <p><b>2927 (2927)</b> <b>Day I,IV: Topic(s) 5, 10</b> Analysis of Global Quality Indicators in the National</p>	<p><b>2810</b> <b>Day I, V: Topic(s) 1, 2, 10</b> Design for Social Innovation: Integrating the Theory and Practice of Action Research and Participatory Design for Organizational and Social Impact <i>Laszlo, Kathia Castro; Schultz, Amelia B.</i></p> <p><b>2812 (2850)</b> <b>Day 1, IV: Topic(s) 1, 7</b> Proposing Values and Practices for a Culture of Organizational Ingenuity: Hacking Systems Thinking to Pursue the Preposterous and Produce the Impossible <i>Rosencrans, Kendra</i></p>	<p><b>2839 (2915)</b> <b>Day IV: Topic(s) 7</b> Toward a Diagnosis of Viability of Small Manufacturing Enterprises. Case: Metal Mechanic Industry <i>Salinas-Reyes, Marcos; Badillo-Piña, Isaias; Tejeida-Padilla, Ricardo</i></p> <p><b>2841 (2914)</b> <b>Day IV: Topic(s) 7</b> A Systemic Approach of the Technological Innovation Process in Mexico <i>García-Jarquin, Brenda; Delgado-Rodriguez, Alfredo; Aguilar-Fernandez, Mario; Morales-Matamoros, Oswaldo; Badillo-Piña, Isaias; Briones-Juarez, Abraham; Sistos-Mendoza, David; Nuñez-Ríos, Juan Enrique</i></p>	<p><b>2860</b> <b>Day I, II, IV: Topic(s) 1, 3, 7</b> Post-Normal Science V Citizen Science: An Exploration of Custom and Practice <i>Gregory, Amanda; Atkins, Jonathan Paul</i></p> <p><b>2966</b> Engaging partnership to improve corporate social responsibility in developing countries. <i>Opon, Dolores</i></p> <p><b>2782</b> <b>Day I, III, V: Topic(s) 1, 6, 9</b> Collaboframework - A Framework for Sustaining Socio-Ecological Systems through Dialogical Knowledge and Action Space <i>Rudan, Sasha Mile; Rudan, Sinisha; Karabeg, Dino</i></p>	<p><b>2820 (2916)</b> <b>Day IV, V: Topic(s) 7, 10</b> Towards Understanding the Effects of Visual Artefacts in Problem Structuring Processes: A Boundary Games Approach <i>Velez-Castiblanco, Jorge Ivan; Londono-Correa, Diana; Naranjo, Olandy</i></p> <p><b>2826</b> <b>Day V: Topic(s) 9</b> A Study of Systems Research Design: An Examination of Systemic and Systematic Methods used to Study Chinese Women's Decision to Study Abroad <i>Zou, Chen; Buckle, Pamela; Edson, Mary; Wilby, Jennifer</i></p>	<p><b>Systems Engineering 2876</b> <b>Day IV: Topic(s) 7</b> Ethics for Cybersystems <i>Paola Di Maio</i></p> <p><b>Organisational Transformation and Social Change 2747</b> <b>Day II: Topic(s) 3</b> Permanent Designing as a Way to Socio-Technical Systems Sustainability Achieving <i>Sazonov, Boris; Korolev, Anton; Kozhevnikov, Dmitry</i></p> <p><b>Action Research 2883</b> <b>Day I, II, IV: Topic(s) 2, 3, 8</b> Returning to Nature, Co-Operative In Mind by Viable System Model <i>Gamero, Claudio; Acevedo Almonacid, Hector Ricardo</i></p>	<p><b>2880</b> <b>Day IV: Topic(s) 8</b> Prospects for a New Systemic Synthesis (Discussion)</p>

<p>Polytechnic Institute, Mexico  <i>Patiño, Julian; Yarzabal Coronel, Nashielly; Patiño Ortiz, Miguel; Cuellar Orozco, Maricela; Ramirez Romero, Tonáhtiu Arturo 2788</i></p>	<p><b>2815</b>  <b>Day I, V: Topic(s) 1, 2, 9</b>          Toxic Leadership in Context  <i>Daniels, Teresa; Metcalf, Gary</i></p>	<p><b>2827</b>  <b>Day IV: Topic(s) 8</b>          Homeostats, Recursions and Time Scales: A Viable System Model Enquiry  <i>Leonard, Allenna</i></p>	<p><b>2851 (2907)</b>  <b>Day I, V: Topic(s) 2, 9</b>          A Theoretical Framework to Capture Stakeholder's Perspectives for the Design of Collaborative Communication Structures for Specialized Organizations  <i>Chongvilaiwan, Tanida; Calvo-Amodio, Javier</i></p>	<p><b>Research Toward a General Theory of Systems</b>  <b>2922 (2923)</b>  <b>Day I: Topic(s) 2,</b>          The General Theory of Metadynamics Systemicity: Part 6: Neighbourhood and the 4d Neighbouring of Things  <i>Blanc, Jean Jacques</i></p>
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15:00 Tea/Coffee (Engineering Lobby) – Poster Viewing in Engineering Lobby

**Paper Sessions 15:30 – 17:00**

Engineering Room ECCR151	Engineering Room ECCR200	Engineering Room ECCR245	Engineering Room ECCR265	Engineering Room ECCR 1B51	Engineering Room ECCR 1B55	Benson 180
<b>Translational Systems Science</b>	<b>Organisational Transformation and Social Change</b>	<b>Systems Ethics and Designing Educational Systems</b>	<b>Socio-Ecological Systems</b>	<b>Human Systems Inquiry</b>	<b>Research Toward a General Theory of Systems</b>	<b>WORKSHOP PART 2</b>
<b>Chair: David Ing</b>	<b>Chair: Louis Klein</b>	<b>Chair: John Vodonick</b>	<b>Chair: Stefan Blachfellner</b>	<b>Chair: Dennis Finlayson</b>	<b>Chair: David Rousseau</b>	<b>Chair: Len R. Troncale</b>
<p><b>2811</b>  <b>Day V: Topic(s) 10</b>          Curriculum Making for TRITO Learning: Wayfaring into a Meshwork of Systems Thinking  <i>Ing, David; Nousala, Susu</i></p>	<p><b>2753 (2938)</b>  <b>Day I, II: Topic(s) 1, 2, 3</b>          Creating Enduring Social Impact: A Model for Multi-Sector Transformational Change  <i>Jacobs, Marty</i></p>	<p><b>2873</b>  <b>Day IV, V: Topic(s) 7, 8, 10</b>          Systems Modeling to Understand Threats to Research Integrity &amp; the Effectiveness of Proposed Solutions  <i>Amber D. Elkins.; Dennis M. Gorman.; Mark A. Lawley</i></p> <p><b>2920</b>  <b>Day I: Topic(s) 1, 2</b>          Mapping the Macro-Level for Interdisciplinary</p>	<p><b>2737 (2939)</b>  <b>Day I: Topic(s) 1, 2</b>          A Framework for Understanding and Achieving Sustainability of Complex Systems  <i>Mobus, George</i></p> <p><b>2918</b>  <b>Day I,II, IV: Topic(s) 2, 3, 8</b>          The Need for a General Systems Transdisciplinarity to Solve Serious</p>	<p><b>2885</b>  <b>Day I: Topic(s) 1</b>          Thinking and Acting Systematically about the Anthropocene  <i>Shim(Sim), Yeon-Soo(Youn-Soo)</i></p> <p><b>2901 (2901)</b>  <b>Day II: Topic(s) 3</b>          Resilience and Ecological Citizenship in Socio-Ecological Systems  <i>Shim, Min-Hu</i></p>	<p><b>2809 (2925)</b>  <b>Day III: Topic(s) 5</b>          The Linkage between Systems Thinking and Ethics  <i>Roth, William F</i></p> <p><b>2779</b>  <b>Day I, IV: Topic(s) 2, 8</b>          A General Framework for Systems Research and Modeling  <i>Kineman, John J.</i></p>	<p><b>2934</b>  <b>Day V: Topic(s) 10</b>          \$5m Later ... Assessment of Four Systems Education Programs: What Works, What Doesn't &amp; Why  <i>Troncale, L. R.</i></p>

<p><b>2856</b> <b>Day I, III: Topic(s) 2, 5</b> Anticipatory Factors in Dialogic Design: Systemic Design Theory and Practice for Collaborative Foresight <i>Jones, Peter</i></p> <p><b>2965</b> A 'Global Sustainability Architecture' towards a sustainable future <i>Agrawalla, Raman K.</i></p>	<p><b>2781</b> <b>Day I, V: Topic(s) 1, 9</b> Transformative Learning Networks <i>Goldstein, Bruce Evan; Risien, Julie; Osbourne-Gowey, Jeremiah; Frankel-Goldwater, Lee; Chase, Sarah Schweizer Claire</i></p> <p><b>2786</b> <b>Day I: Topic(s) 1</b> Opportunity Tension at the Center of Sustainable Organization: Positive Organizational Scholarship and Generative Emergence <i>Best, Jim</i></p>	<p>Decision Making - A Visual Framework and Method <i>Hieronymi, Andreas</i></p> <p><b>2774</b> <b>Day I, IV: Topic(s) 2, 8</b> A Good Approach to Wicked Problems <i>Vodonick, John</i></p>	<p>Systemic Challenges facing Present-Day Socio-Ecological and Socio-Technological Systems <i>Blachfellner, Stefan</i></p> <p><b>2878</b> <b>Day II, IV: Topic(s) 3, 7</b> Systems Models of the Social Ecology of Traffic Safety to Analyze the Effectiveness of Interventions <i>Amber D. Elkins,; Eva M. Shipp,; Dennis M. Gorman,; Mark A. Lawley</i></p>	<p><b>2902 (2902)</b> <b>Day II: Topic(s) 3</b> On the Domesticated Bodies of North Korean Residents <i>Shim, Jingon</i></p> <p><b>2953</b> <b>Day I: Topic(s) 2</b> The Future of Scientific Probing and Social Being: Quantum Computation, Artificial Intelligence, and Consciousness <i>Popovich, Mila</i></p>	<p><b>2756 (2917)</b> <b>Day I, IV: Topic(s) 2, 8</b> System Language: Understanding Systems <i>Mobus, George; Anderson, Kevin</i></p>	
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17:15 – 18:00 ISSS AGM (Math 100)

19:00 Evening

19:00 – 21:00

Conference Dinner – University Memorial Center (UMC) Ballroom  
Best Paper Awards – Alexander Laszlo  
Goldberg Award – John Kineman  
Press Release – Paul Sperry and Alec Tsoucatos  
Incoming Inaugural Address ISSS2017, Vienna – Professor Ockie Bosch  
Cultural Programme- Mila Popovitch

**Friday: July 29, 2016**  
**Education, Communication, and Capacity**

REGISTRATION DESK OPEN 07:45 – 18:00 (Lobby, Maths 100)

07:15 to 08:15 ISSS RoundTable Discussion (Treehouse Room, C4C Dining Room)

**08:30 Plenary Session (Maths 100 Lecture Theatre)**

08:30

**Plenary IX: Human Capacity, Communication, and Student Research**

*Description:* Systemic Sustainability and Systems Literacy ultimately involve transformative changes at the personal and social level. What individual competencies are needed and how will student researchers navigate the treacherous waters ahead for 'out-of-the-box' thinkers? We emphasize the importance of integrated personal skills and effective collaborative and innovative networking to build transformative communities.

**Chair:** Pamela Buckle

**Speakers:**

**Pamela Buckle** (The Challenge of Graduate Research in systems science and practice)

**Delia Pembrey MacNamara** (Ranulph Glanville Memorial Talk) – *Connection and Collaboration in the Networked World (for Systemic Purpose/Action)*

**Student Award Papers (Vickers, Rapoport, Mead)**

**10:15 – 10:30 Tea/Coffee (Maths 100 Courtyard)**

10:30

**Plenary X: Systems Literacy Education and Outreach**

**Description:** Achieving sustainable and more synergistic futures requires education in systems thinking and connection with new modes of social communication. Our highest priority should be to legitimize whole systems research and to provide adequate guidance to student/expert collaborative learning within a program of Systems Literacy. How do we 'train the trainers' and launch this program?

**Chair:** Peter Tuddenham

**Speakers:**

10:30 – 11:30 **Graduate Course Student Report (introduced by Ray Ison)**

11:30 – 12:15 **Peter Tuddenham and Delia Pembrey MacNamara** — *Systems Literacy Dialogue*

**12:15 Lunch (C4C Cafeteria included in meal cards)**

**13:30 Plenary Session (Maths 100 Lecture Theatre)**

13:30

**Afternoon Plenary A: Education Synthesis Panel**

**Description:** Conference goals for an educational agenda were explored in a number of special workshops. While theories and approaches are diverse, this panel will provide an opportunity to connect different approaches and to explore common ground toward an agenda for the future of systems education, especially related to systemic sustainability praxis, science, policy, and ethics.

**Chair:** Ockie Bosch

**Panellists:**

**Ockie Bosch, Peter Tuddenham, Dino Karabeg, Len Troncale, , Mary Edson, Ray Ison and Pavel Luksha**



15:00 – 15:30 Tea/Coffee (Maths 100 Courtyard)	
	<p><b>Afternoon Plenary B: Conference Closing</b>  <b>Chairs:</b> Ockie Bosch, Peter Tuddenham, John Kineman and Mila Popovitch</p> <p><b>Description:</b> Concluding Program  Concluding remarks  Closing Program</p>

09:00 – 12:00 Planning for 2017 Session (Maths 100 Lecture Theatre)	
17:30 - 19:00	<p><b>Catered Reception at Fiske Planetarium (Lobby) Sponsors:</b> Future Earth and ISSS.</p> <p><b>Fiske Planetarium Program:</b>  <b><i>The Anthropocene Experience: Shaping Sustainable Futures, From Science to Society, with Josh Tewksbury</i></b>  <b>Chair:</b> Joshua Tewksbury</p> <p><b>Description:</b> In the span of several thousand years, humans have gone from a minor player on the Earth to a species capable of reshaping the planet in profound ways. Join us for this immersive experience as Joshua Tewksbury of the global research group Future Earth takes you on a journey from the origins of human societies to the present day -- and addresses how the ingenuity of people around the world can shift the planet, either for better or worse. For more information on Future Earth: <a href="http://futureearth.org/">http://futureearth.org/</a>. This event is being co-hosted by the International Society for the Systems Sciences (ISSS), as the final event of the ISSS 2016 Conference - Realizing Sustainable Futures in Socio-Ecological Systems. For more information: <a href="http://www.iss2016usa-india.com/">http://www.iss2016usa-india.com/</a></p>
19:00 – 21:00	

**Saturday: July 30, 2016**

09:00 – 12:00 Planning for 2017 Session (Maths 100 Lecture Theatre)	
09:00 – 12:00	<p><b>ISSS2017 Planning Meetings</b>  9:00 – 12:00 <b>Planning sessions for future events, focussing on ISSS-2017.</b>  9:00 – 12:00 <b>Graduate Course Final Session – Self organising.</b></p>

**12:00 Close of Conference**

