

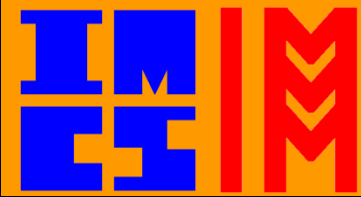


DIME



# Next Year an International Challenge Will be open to High Schools...

# The Simulation Exploratory Experience





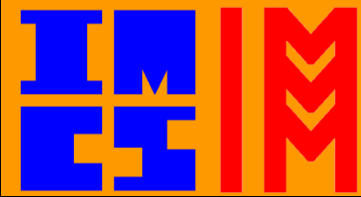
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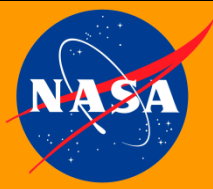


# In MMXVII, you could be selected to be part of the next edition of Simulation Exploration Experience (SEE)

*Are you ready for the Challenge?*

*Would you know more about SEE?*





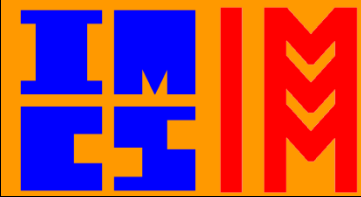
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# The Simulation Exploration Experience (SEE), education opportunity in Higher Education prepares College Students to Thrive with Chaos

**Priscilla Elfrey**  
KSC NASA

**Richard Severinghaus**  
CRTN Solutions, LLC

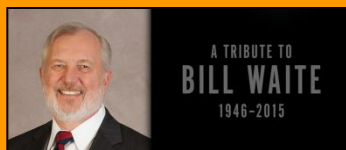




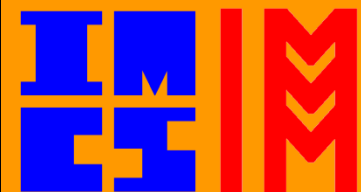
DIME



VIRTUAL ENGINEERING CENTRE



My projected path to the Moon is better than yours





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CAL POLY SAN LUIS OBISPO



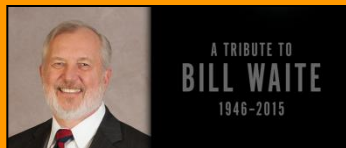
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Brunel UNIVERSITY WEST LONDON

der bundeswehr universität münchen

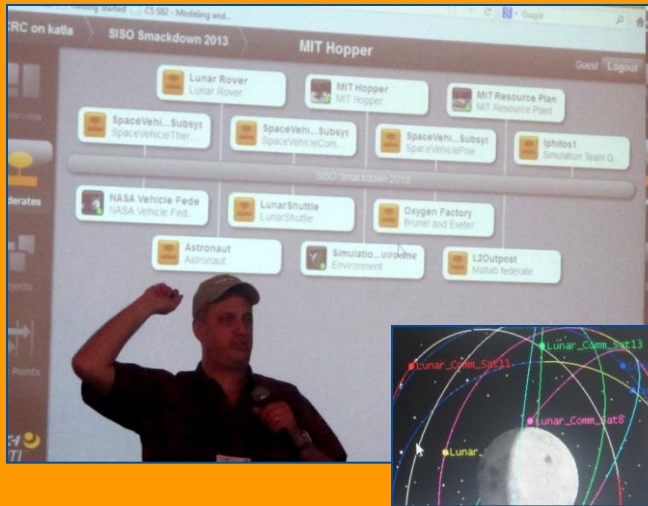


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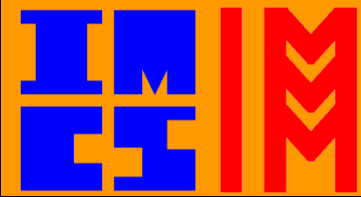
GICSR

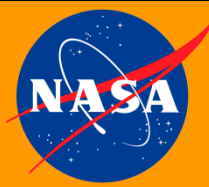




# Simulation Exploration Experience Basics

- What is the SEE Simulation?
- Why do we have a SEE?
- Who is involved in SEE?
- When are the SEE events held?
- Where are the SEE events held?





# SEE Aim



- The SEE (formerly Smackdown) is an effort to promote the concepts of M&S as a discipline at the University Undergraduate, Graduate, PhD Levels, Postgraduates and, even, to raise the awareness of Modeling & Simulation down into the K-12 grades
- This is accomplished through an anticipation program involving students and faculty in "building" an HLA based distributed simulation of a space system
- For first Years, Smackdown Topic was simple such as: A Lunar Base Scenario



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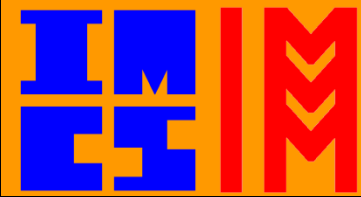
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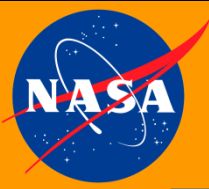
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universität münchen



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# Why SEE?

- Modeling and Simulation is a critical tool in both science and engineering. Unfortunately, programs that provide strong educational background in M&S are rare.
- SEE is an effort to promote better awareness and understanding of both the importance and the complexity of modern Modeling & Simulation through hand-on mentoring and participation with M&S Practitioners
- Interoperable Simulation Evolution (i.e. HLA Evolved) requires to be diffused



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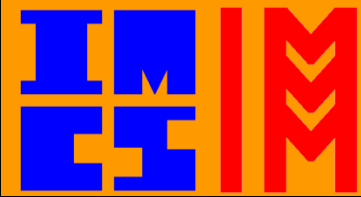
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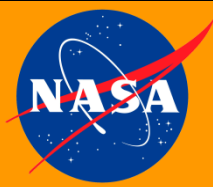
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# NASA Leadership



My projected path to the Moon is better than yours



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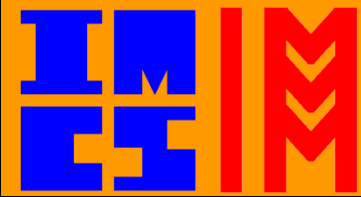
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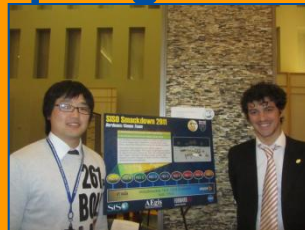


# SMACKDOWN 2011

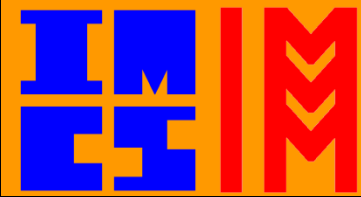
## Spring Simm, Boston & I3M, Rome

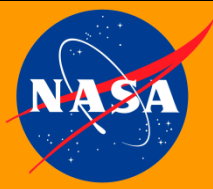


My projected path  
to the Moon is  
better than yours



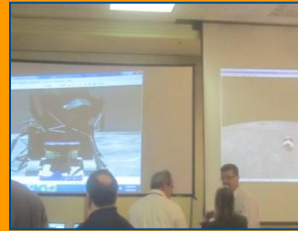
DIME





# SMACKDOWN 2012

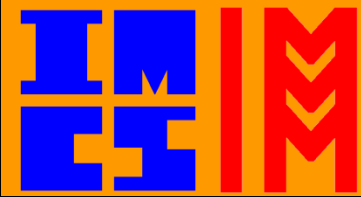
Orlando → Wien → Rome

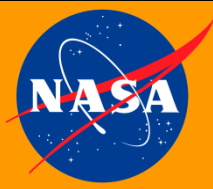


SpringSim  
I3M  
WAMS / CAX Forum



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# SMACKDOWN 2013

San Diego → Rome → Toronto → Athens → Buenos Aires



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For SISO SmackDown 2013, event organizers welcome interest from universities in the US, Europe, Near East and Far East. Additional support comes from the NASA KSC Center for Life Cycle Design's (CfLCD) summer intern team, Creative Humanics Laboratory (CHL). CHL, comprised of students from the Institute of American Indian Arts (IAIA) and other tribal colleges who created and updated this website as a "SISO SmackDown Starter Kit" to enable each team to participate more efficiently and with a higher level of collaboration.

<http://sisosmackdown.com>





# SEE 2014 as Evolution

Tampa → Bordeaux → Istanbul



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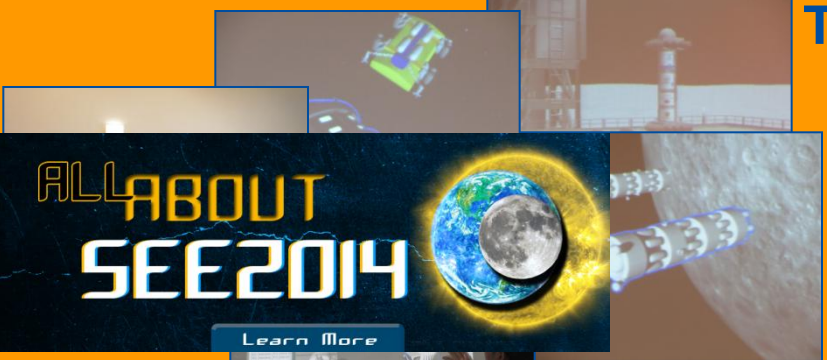
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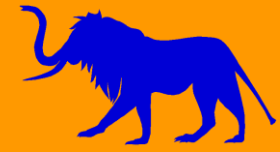
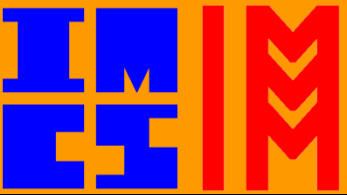
Learn More

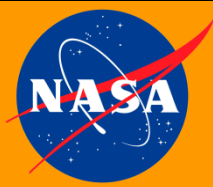


Learn More

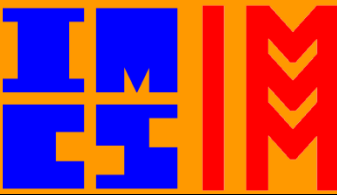
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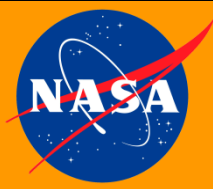
[www.liophant.org/conferences/2016/see](http://www.liophant.org/conferences/2016/see)  
[www.exploresim.com](http://www.exploresim.com)





# SEE 2015 Arlington





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# Smackdown Federation

Lunar ISAC

Lunar Shuttle

Iphitos Interceptor

Lunar Mass Driver

ISRU Mobile

L2 Tower Antenna Array

Spirals Lunar Depot

Astronaut Team

Lunar Hopper

Regolith Hauler

Asteroid

Oxygen Factory

Moon Satellites x 6

Lunar Lander



Middleware: HLA 1516 Evolved  
Mäk / Pitch



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GICSR





# SEEHLA Evolved Federation Massachusetts Institute of Technology



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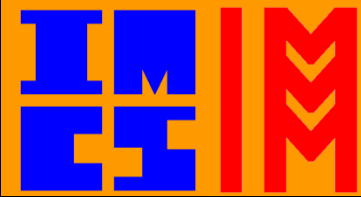


CAL POLY  
SAN LUIS OBISPO

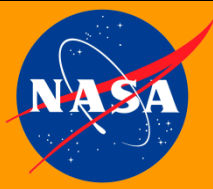
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# Federates from Europe

Italy  
France  
Germany  
UK



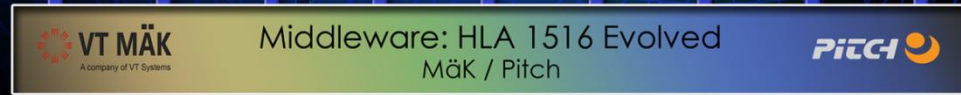
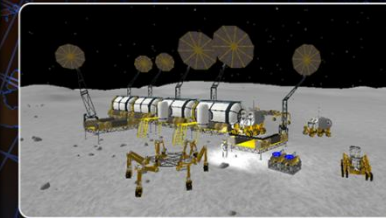
## SISO Smackdown I Bordeaux/Genoa Team

A. The Bordeaux/Genoa Team: Earth Cargo Depot

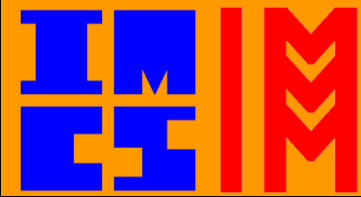
B. The Bordeaux/Genoa Team: Supply Cargo Depot

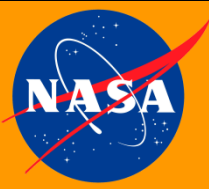
The Bordeaux and Genoa team are working together on the lunar supply depot federate to include He-3, Moon Rock, and other material that will be transported to earth.

The Earth Cargo Depot consists of parts, supplies, propellant, and oxygen. The Supply Cargo Depot consists of objects for lunar surface use. They are addressing depot sites, logistic standard units depot code, position, size, hazards, location, storage modules, functions, interface and inventory management.



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# Federate from Alabama

## SISO Smackdown 1 UAHuntsville Team

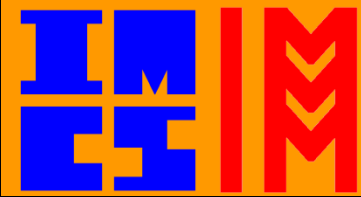


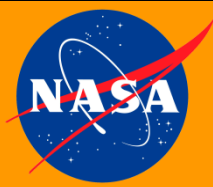
### C. The UAHuntsville Team: Lunar Communication Satellite

The University of Alabama in Huntsville (UAH) Kepler Federation (KFed) simulates a lunar communication satellite. A satellite constellation could be simulated through multiple instantiations of the federate. Originally, KFed was developed with IEEE1516-2000; so, the focus of this year's effort was on migration to the current version of High Level Architecture (HLA). For this Smackdown event, KFed will publish velocity and position as the satellite orbits the moon. Future development activities may include subscribing to operational status messages published by other participating models.



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# Federates from MIT

## SISO Smackdown

### MIT Team

D. The MIT Team: High-mobility Scouting Hopper

E. The MIT Team: Mobile In-situ Resource Utilization Plant

The MIT team has developed elements to participate in a fuel and resource economy in support of lunar space exploration. A high-mobility scouting hopper is used to analyze resource concentrations at potential mining sites. A mobile in-situ resource utilization (ISRU) plant processes resources for future use.



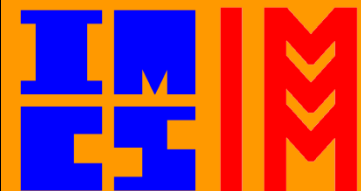
High-mobility Scouting Hopper

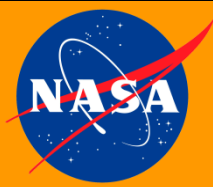


Mobile In-situ Resource Utilization Plant



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# Federates from NASA

## SISO Smackdown NASA Student Intern Team



F. NASA Student Intern Team: Lunar Orbit Shuttle

G. NASA Student Intern Team: Lunar Transport Rover

The NASA Student Intern Team is modeling a lunar cargo delivery system. This system will transport cargo (fuel, water, food and other consumables) to the lunar surface. This system will also bring He-3, mined on the moon, from the lunar surface back to low lunar orbit. The systems consist of a lunar orbit shuttle and a transport rover.

NASA initiated the Smackdown, serves as executive chair, mentors and supports team activity: technical, outreach & planning

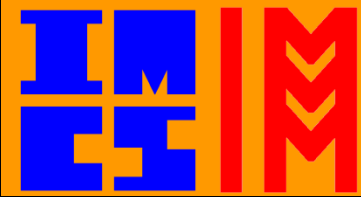
- FED A
- FED B
- FED C
- FED D
- FED E
- FED F
- FED G
- FED H
- FED I



Middleware: HLA 1516 Evolved  
Mäk / Pitch



DIME





# Federate Viewer



**SISO Smackdown**  
ForwardSim Team

**FORWARD SIM**  
simulations & technologies



H. ForwardSim Team: 3D Viewer of the Scene on the Moon

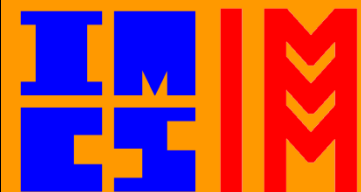
ForwardSim offers the HLA Toolbox™ for MATLAB and Simulink. Compatible with all HLA standards and all RTI's, our products offer reusability of existing MATLAB/Simulink models and interoperability with any HLA compliant federation along with all the development capabilities of MATLAB and Simulink. Reduce learning curve and produce HLA federates efficiently.

- FED A
- FED B
- FED C
- FED D
- FED E
- FED F
- FED G
- FED H
- FED I

VT MÄK A company of VT Systems | Middleware: HLA 1516 Evolved Mäk / Pitch | PITCH



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# SMACKDOWN 2012 Awards



SpringSim, Orlando, FL, USA - March 26-29, 2012

During Smackdown 2012, best projects from Academia was awarded by the Scientific Committee of Smackdown2012; the Simulation Team was awarded with two Award for his contribution to the HLA Moon Base Simulation; We achieved "Standard Award" and "Interoperability Award"; in fact our Federates, SPIRALS and IPHITOS, was the only one able to run in both MAK and Pitch Federation Concurrently.

### IPHITOS

### SPIRALS

- Prof.A.G Bruzzone - MISS Diptem Genoa University, Italy
- Prof.G.Zacharewicz - University of Bordeaux, France
- Dr.E.Bocca - Mast Srl, Italy

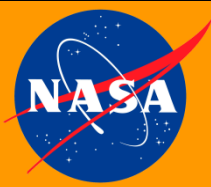
- Prof.A.G Bruzzone - MISS Diptem Genoa University, Italy
- Prof.P.Teofilatto - University of Rome - La Sapienza, Italy
- Dr.Antonella Spano - MBDA La Spezia, Italy
- Dr.Luca Piazza Bonati - MBDA La Spezia, Italy
- Dr.Tonino Genito - MBDA Rome, Italy
- Dr.A.Garro - UNICAL, Italy

### Projects

- F.Madeo, Simulation Team, Italy
- M.Biagini, DIMS, Genoa University
- J.Villanueva, Genoa University

- F.Tarone, MAST srl, Italy
- D.Ferrarotti, Pisa University
- G.Cantice, DIMS, University of Genoa, Italy
- M.Turi, DIMS, University of Genoa, Italy
- M.Pontani, La Sapienza, Italy

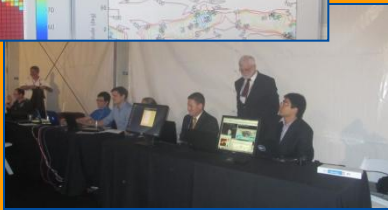
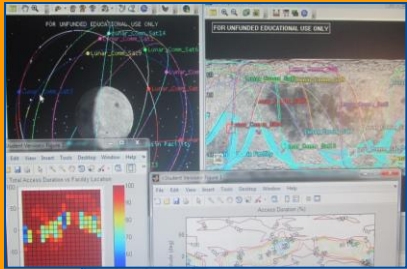




# SMACKDOWN 2013 Awards



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*See...*  
A RESUPPLY MISSION TO THE MOON!

*Hear...*  
LOUD APPLAUSE FOR SIMULATION TEAMS!

*Feel...*  
SMACKDOWN'S IMPACT ON THE FUTURE!

*Simulation*  
**SmackDown**  
**2013**

A REALTIME, DISTRIBUTED, INTER-UNIVERSITY MODELING & SIMULATION COMPETITION!

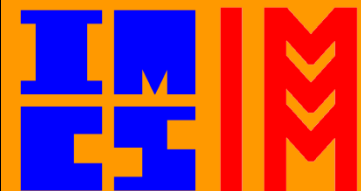
IN AMAZING COLOR



VT Mak  
Pitch  
Springer  
Awards &

IPad  
Full Licences  
New M&S Books  
Plaques

i.e. Genoa University Team obtained Award for Best Co-ordination





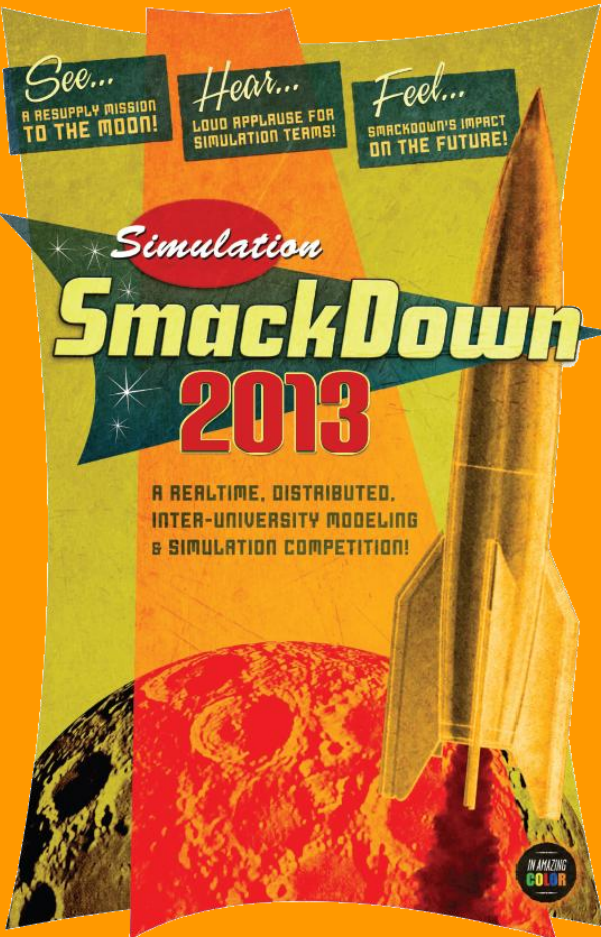
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SMACKDOWN'S IMPACT  
ON THE FUTURE!

# Simulation SmackDown 2013

A REALTIME, DISTRIBUTED,  
INTER-UNIVERSITY MODELING  
& SIMULATION COMPETITION!



IN AMAZING  
COLOR

# SMACKDOWN ITEC2013 Rome



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VIRTUAL  
ENGINEERING  
CENTRE



UNIVERSITY OF  
Nebraska  
Lincoln

CAL POLY  
SAN LUIS OBISPO



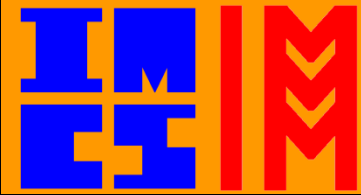
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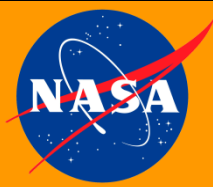
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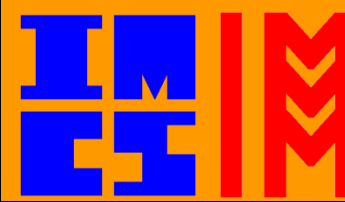
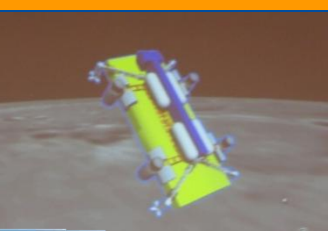
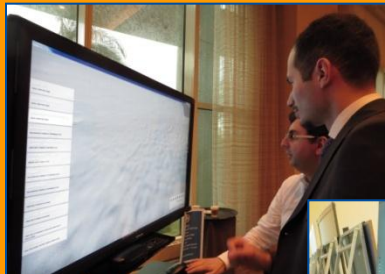
# SMACKDOWN 2014 Awards

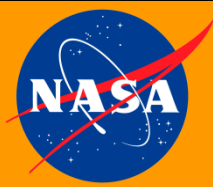


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# SMACKDOWN 2015 Arlington



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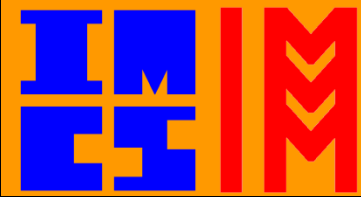
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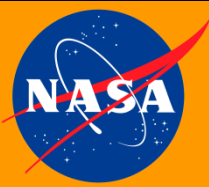


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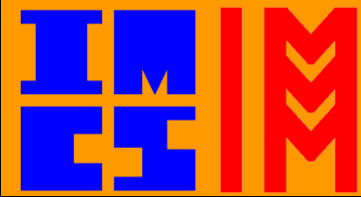
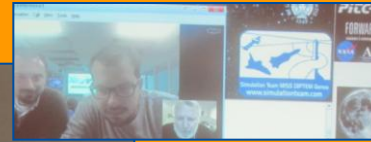
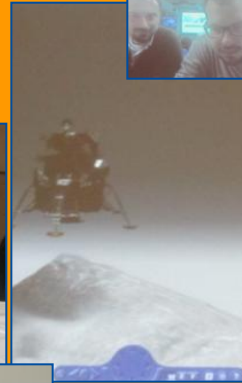
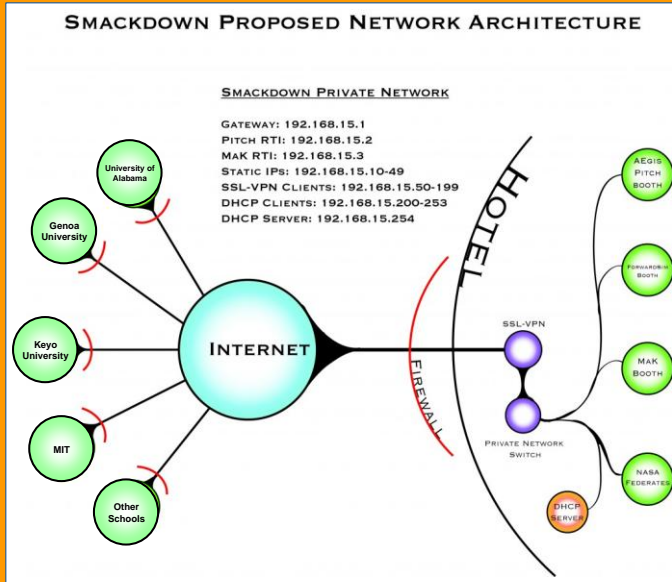
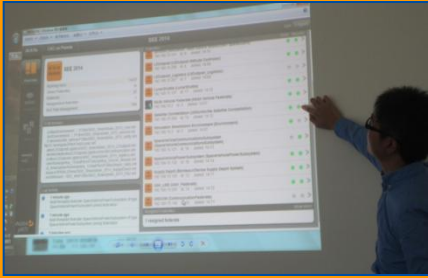
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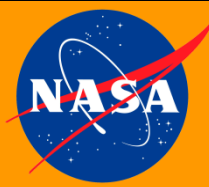
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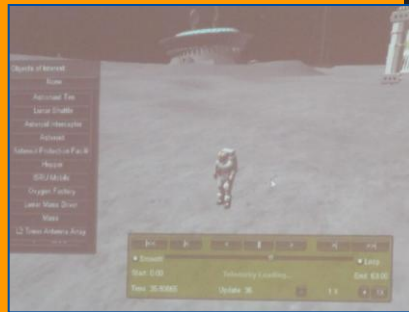


# SMACKDOWN Network





# SEE Organization



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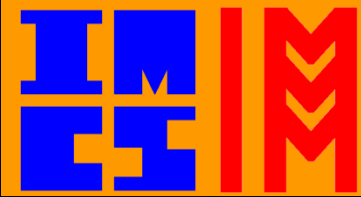
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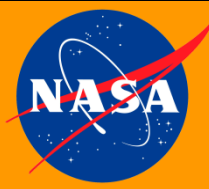
## MARKETING TEAM

Creative Humanics Laboratory, Center for Life Cycle Design, NASA KSC: Craig Tompkins, Lead  
Webmaster: Louva Hartwell



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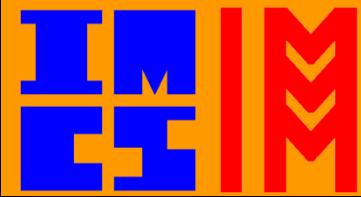


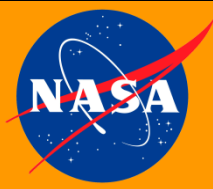
**ACADEMIC OPPORTUNITIES**  
 SmackDown Team Project: Genoa University  
 Introduction to M&S: RKS Tribal College  
 Class: University of Alabama Huntsville  
 Class: MIT  
 Capstone Course: Pennsylvania State University  
 Project Team Members: University of Pisa  
 Internship: MBDA, MAST, Lio Tech, CMRE  
 Independent Study on 3D Modeling: Institute for American Indian Art  
 Research Study: Technion Institute of Technology, Israel  
 Independent Study on Interoperability: University of Bordeaux  
 Project Team Members: La Sapienza, Rome  
 Branding CHL Team at KSC

**SCIENTIFIC ORGANIZATIONS**  
 Alabama Modeling and Simulation Council  
 Institute of Electrical and Electronics Engineering (IEEE)  
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If you are interested in future developments don't hesitate to contact:

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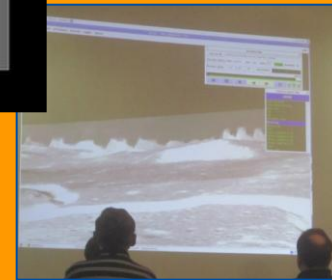
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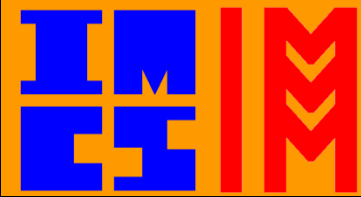


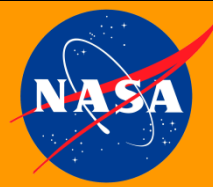
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# Time for Questions & Discussions



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