

# Foundations '02 Program Table of Contents

(this version is close to what was distributed to attendees – a few session leaders were corrected and a few presentations for which no papers were produced are identified; this version does not nor contain the participant list, CD order forms, etc. that were in what participants received nor reflect late changes in or additions to session assignments)

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# *Foundations for V&V in the 21<sup>st</sup> Century*

## **A Workshop Known as *Foundations '02***

October 22-24, 2002 at the Kossiakoff Conference & Education Center  
The Johns Hopkins University Applied Physics Laboratory  
Laurel, Maryland USA

### **Foundations '02 expects to accomplish four primary objectives:**

- 1) Produce a clear & comprehensive description of the state of the verification and validation (V&V) art for modeling and simulation (M&S).
- 2) Produce a current bibliography of critical and substantive V&V literature and resources related to M&S.
- 3) Create a comprehensive and coherent statement of M&S V&V research needs.
- 4) Encourage and stimulate substantial and sustained information exchanges about V&V by various M&S communities (such as DoD, DOE, NASA, industry, professional societies, and academia) so that "best practices" may be employed by all and appropriate standard procedures become common throughout all M&S communities.

### **Foundations '02 Sponsors** (28 organizations which endorse addressing these objectives)

- Association for Computational Machinery (ACM) Transactions on Modeling & Computer Simulation (TOMACS)
- Aegis Technology Group, Inc.
- American Society of Mechanical Engineers (ASME) Applied Mechanics Division (AMD)
- Arizona Center for Integrative Modeling & Simulation (ACIMS)
- Boeing Phantom Works
- Center for Economic Research (CentER), Tilburg University (Netherlands)
- Clemson University
- **Defense Modeling and Simulation Office (DMSO) – primary initiating sponsor**
- Federal Aviation Administration (FAA) Flight Standards Service
- Gesellschaft für Informatik (Bonn, Germany)
- Illgen Simulation Technologies
- Innovative Management Concepts, Inc. (IMC)
- **Johns Hopkins University/Applied Physics Laboratory (JHU/APL) – facility provider**
- Joint Accreditation Support Activity (JASA)
- **Modeling and Simulation Subcommittee of the Joint Army Navy NASA Air Force (JANNAF) Interagency Propulsion Committee – initiating sponsor**
- McLeod Institute of Simulation Sciences -- California State University (CSU), Chico
- Ministry of Defence (UK) Synthetic Environment Coordination Office
- Modeling & Simulation Information Analysis Center (MSIAC)
- NASA Ames Research Center
- National Institute of Standards and Technology (NIST)
- **National Training Systems Association (NTSA) – hosting sponsor**
- Office of Naval Research (ONR)
- Shodor Education Foundation, Inc.
- Simulation Interoperability Standards Organization (SISO)
- Survivability/Vulnerability Information Analysis Center (SURVIAC)
- The Society for Modeling and Simulation International (SCS)
- United States Association for Computational Mechanics (USACM)
- University of Central Florida Institute for Simulation and Training (UCF/IST)

# Leadership & Schedule Information

## **Foundations '02 Leadership**

General Chair: **Simone Youngblood** (DMSO)

Program Co-chairs: **Dale Pace** (JHU/APL) and **Steve Stevenson** (Clemson)

Authors & Session Leaders indicated in Session Descriptions below

## **Schedule Information**

### **Registration, Information Desk, & Administrative Support**

0730-1600 Tuesday & Wednesday (October 22 & 23)

### **Opening Plenary Session\*, 0800-1100 Tuesday, October 22nd**

Welcomes from JHU/APL and DMSO

Keynote Speakers

**Anthony Cerri**, Experimentation Engineering Depart M&S Division Chief, Joint Forces Command

*V&V Experiences from MC02 & Joint Experimentation:*

*the Good, the Bad, & the Ugly*

**David Crandall**, Dept of Energy Defense Programs

*The Essential Role of Credible Correct Simulation in Assuring the Safety of*

*America's Nuclear Stockpile*

**Linda Rosenberg**, NASA Chief Scientist for Software Quality Assurance

*Software Quality Assurance at NASA*

Workshop Orientation

### **Lunch, 1100-1200 Tuesday, October 22<sup>nd</sup>**

### **Session 1, 1200-1530 Tuesday, October 22<sup>nd</sup>**

Invited Paper Sessions: A1, A2, A4, A5/T5 (combined), and A6

Special Topic Sessions: T1, T2, T4, and T7

### **Plenary Review Session\*, 1530-1630 Tuesday, October 22nd**

### **Social Time/Mixer, 1700-1900 Tuesday, October 22nd**

### **Session 2, 0830-1200 Wednesday, October 23<sup>rd</sup>**

Invited Paper Sessions: B1, B2, B3, B4, B5, and B6

Special Topic Sessions: T3, T6, and T8

### **Lunch, 1200-1300 Wednesday, October 23<sup>rd</sup>**

### **Closing Plenary Session\*, 1300-1600 Wednesday, October 23<sup>rd</sup>**

Synopsis of Insights & Pervasive Issues

Synopsis of Research Needs

Closing Keynote: *The Road to the Future – How to Implement Needed Research*

**Randall Shumaker**, UCF Institute for Simulation and Training Director

### **Foundations '02 Products, 0830-on Thursday, October 24<sup>th</sup>**

Foundations '02 leaders (authors, session chairs, recorders) draft workshop products

\*Plenary Session Moderator: Dr. Dale K. Pace, Foundations '02 Program Co-chair

# Sessions Descriptions, Leadership, & Authors

Papers A1-A6 and B1-B6 are Invited Paper sessions.

Papers T1-T8 are Special Interest Topic Sessions.

We have indicated paper length for many of the papers.

Session leadership (chairs and recorders) are separate from the authors since the session leadership is responsible to ensure that discussion of the subject is robust and capturing that discussion for publication as part of the Foundations '02 product.

Foundations '02 expects to achieve its objective of articulating the state of V&V art for M&S mainly through the invited paper sessions. The invited paper authors have produced substantive papers that identify current capabilities, issues, key literature, and research needs for M&S V&V in the area addressed by the invited paper. Author(s) will have adequate time to present a paper's substance. Then the paper will be discussed by those present to identify caveats, alternative views, etc. That discussion will be captured and a synopsis of it will be published in the Foundations '02 proceedings along with the invited paper. The combination of the two (invited paper and discussion synopsis) should provide a balanced description of the state of V&V art for M&S in that particular area.

Special Interest Topic sessions do not have as rigorous a structure as the invited paper sessions.

The Foundations '02 proceedings, which will be available on CD from The Society for Modeling and Simulation International (SCS), will contain their papers and discussion synopses as well. The proceedings will also contain all Foundations '02 presentations.

**Session A1: Verification Technology Potential with Different M&S Development & Implementation Paradigms.** Verification technology includes the full spectrum of CASE tools and automated requirements/specification/test/code generation capabilities as well as formal methods, model checking, and related techniques. Development paradigms include both the traditional waterfall (serial development) and interactive development methods such as rapid prototyping, spiral development, etc. Implementation paradigms include heterogeneous legacy codes which may be close to a black box, object-oriented (O-O), formal systems, adaptive processing techniques (such as AI, fuzzy sets, genetic algorithms, etc.), distributed simulation reuse of existing simulation components.

Session Chairs: **Robert O. Lewis** (Boeing) and **Reed Little** (SEI)

Session Recorder: **John Carr, III** (Naval Surface Warfare Center)

Paper & Authors:

*Verification Technology Potential with Different Modeling and Simulation Development and Implementation Paradigms* (40 pp)

**Garth R. MacKenzie** (University of Maryland)

**G. Gordon Schulmeyer** (PYXIS Systems)

**Levent Yilmaz** (Trident Systems)

**Session A2: Selected V&V (especially validation) Methods and Technologies.** This session will address requirements V&V, statistical techniques in V&V, V&V in testing/T&E, and fundamental and theoretical limits on V&V. This topic is related to current research on validation metrics.

Session Chairs: **Jim Cavendish** (General Motors)  
**Kevin Greenaugh** (DOE National Nuclear Security Administration)

Session Recorder: **Michael McKay** (Los Alamos National Laboratory)

Papers & Authors:

*Statistical Foundations for the Validation of Computer Models* (28 pp)

**Robert G. Easterling** (Statistical Consultant)

**James Berger** (Duke University & National Institute of Statistical Sciences)

*Measuring Predictive Capability of Computational Models: Foam Degradation Case Study* (20 pp)

**Robert G. Easterling** (Statistical Consultant)

*A Framework for Validation of Computer Models* (59 pp)

**M. J. Bayarri** (National Institute of Statistical Sciences)

**James Berger** (Duke University & National Institute of Statistical Sciences)

**D. Higdon** (National Institute of Statistical Sciences)

**M. C. Kennedy** (National Institute of Statistical Sciences)

**A. Kottas** (National Institute of Statistical Sciences)

**R. Paulo** (National Institute of Statistical Sciences)

**J. Sacks** (National Institute of Statistical Sciences)

**J. A. Cafeo** (General Motors)

**J. Cavendish** (General Motors)

**C. H. Lin** (General Motors)

**J. Tu** (General Motors)

**Session A3: M&S Assessment.** Unfortunately, this session had to be canceled.

**Session A4: Subject Matter Expert (SME)/Peer Use in M&S V&V.** Review is a primary validation technique. How reviewers are selected, managed, and used is very important as are how reviews are conducted and responses to them.

Session Chairs: **Bill Dunn** (IITRI) and **Bill Waite** (Aegis Technology Group)

Session Recorder: **Bob Senko** (DMSO).

Paper & Authors:

*Subject Matter Expert (SME)/Peer Use in M&S V&V* (34 pp)

**Dale Pace** (JHU/APL)

**Jack Sheehan** (DMSO & DOTE C3I & Strategic Systems Directorate)

## **Combined Session: A5 & T5**

Session Chairs: **Dan Craigen** (ORA, Canada)  
**Dirk Brade** (Universität der Bundeswehr München, Germany)  
Session Recorder: **Brad Martin** (NSA)

**A5: Use of Formal Methods in V&V.** Formal methods which have potential to create mathematically-provable correctness provide hope for improvements in software quality. Identifications of where such is appropriate, personnel requirements to develop such, and personnel requirements to perform V&V on such is of particular interest and importance.

Paper & Authors:

*Cost Effective Use of Formal Methods in Verification and Validation* (38 pp)

**Richard Kuhn** (NIST)  
**Ramaswamy Chandramouli** (NIST)  
**Ricky W. Butler** (NASA/Langley Research Center)

**T5: Formal Systems and Their V&V Utility.** The evolving nature of software development poses a continuing series of challenges for V&V. In response, the V&V community selectively adapts the use of existing V&V activities, and introduces new and improved ones. These responses are instances of the more general issues of technology selection and technology infusion.

Paper & Author:

*Infusing and Selecting V&V Activities* (15 pp)

**Martin Feather** (NASA Jet Propulsion Laboratory (JPL) at Cal Tech)

**Session A6: Implications of M&S Foundations** (i.e., Basic M&S Characteristics) for V&V. This contribution makes the point that effective enablers for V&V are derived from the foundations of M&S as characterized by general and special theories and methodologies. Modeling concepts, theories, and methods provide the underlying basis for model specification, homomorphism, and validation. Formal simulation approaches (e.g., parallel/distributed in logical/real time) provide the means to examine simulation correctness and their applicability. Combined model and simulator specifications provide the basic means necessary to model and simulate families of models and assess their self-consistency as a whole in isolation and their validity in relation to real-world phenomena.

Session Chairs:

**Michael Moulding** (Cranfield University, UK)  
**Dave Thomen** (Army Modeling and Simulation Management Office)

Paper & Authors:

*Implications of M&S Foundations for the V&V of Large Scale Complex Simulation Models* (50 pp)

**Bernard P. Zeigler** (University of Arizona)  
**Hessam S. Sarjoughian** (Arizona State)

**Session B1: V&V (especially validation) for M&S in Computational Science and Engineering Applications.** Computational mechanics, computational fluid dynamics (CFD), etc. and other simulation applications pose particular V&V challenges.

Session Chairs: **Unmeel Mehta** (NASA/Ames) and **Hans Mair** (IDA)

Session Recorder: **Len Schwer** (**Schwer** Engineering & Consulting)

Paper & Authors:

*Verification, Validation, and Predictive Capability in Computational Engineering and Physics* (74 pp)

**William L. Oberkampf** (Sandia National Laboratories)

**Timothy G. Trucano** (Sandia National Laboratories)

**Charles Hirsch** (Vrije Universiteit Brussel -- Brussels, Belgium)

**Session B2: V&V for M&S with Hardware or Systems in the Loop** (including all manifestations of distributed simulations). Interfaces and interoperability with hardware, systems, and/or other simulations pose special V&V challenges.

Session Chairs: **Dave Bort** (JHU/APL)

**Bill Ormsby** (Naval Surface Warfare Center)

Paper & Authors:

*Validation of Hardware in the Loop (HWIL) & Distributed Simulation Systems* (83 pp)

**Bill Waite** (Aegis Technology Group)

**Alexander Jolly** (RDEC, Army Aviation and Missile Command)

**Steven J. Swenson** (Naval Undersea Warfare Center)

**Lt Col Seth Shepherd** (US Air Force Electronic Warfare Evaluation Simulator Test Facility)

**Robert Gravitz** (Aegis Technology Group)

**Session B3: V&V (especially validation) for M&S with Human Behavior Representation or People in the Loop**, both M&S which require high fidelity and those

which do not require high fidelity. The first kind of M&S may be used in aircraft and nuclear power plant simulators and other safety critical kinds of M&S. The second kind of M&S may be used in war games, entertainment, and other simulations which do not have safety critical implications.

Session Chairs: **John Tyler** (MITRE) & **Sue Numrick** (DMSO)

Session Recorder: **Randy Saunders** (JHU/APL)

Papers & Authors

*Introduction to Session B3: V&V for M&S with Human Behavior Representation or People in the Loop* (1 page)

**Scott Harmon** (Zetetix)

**Archie E. Dillard** (FAA Flight Standards Service)

*Validation of Human Behavior Representations* (34 pp)

**S.Y. Harmon** (Zetetix)

**C.W.D. Hoffman** (U.S. Army White Sands Missile Range)

**A.J. Gonzalez** (University of Central Florida)

**R. Knauf** (Technische Universität Ilmenau, Ilmenau, Germany)

**V.B. Barr** (Hofstra University)

*Validation of Advance Flight Simulators for Human-Factors Operational Evaluation and Training* (87 pp)

**Archie E. Dillard** (FAA Flight Standards Service)

**Session B4: Estimating V&V Resource Requirements and Schedule Impact.** Methods used to predict the level of V&V resources required for various levels of M&S credibility and the impact of such V&V activities on M&S development and use schedule is a matter of great interest.

Session Chairs: **Roger Logan** (Lawrence Livermore National Laboratories)

**David Fritz** (JHU/APL)

Session Recorder: **Richard Bernstein** (JHU/APL).

Paper & Authors:

*Estimating V&V Resource Requirements and Schedule Impact* (106 pp)

**Michelle Kilikauskas** (Joint Accreditation Support Activity, JASA)

**Dirk Brade** (Universität der Bundeswehr München, Germany)

**Bob Gravitz** (Aegis Technology Group)

**Dave Hall** (SURVICE Engineering Company)

**Martha Hoppus** (Joint Accreditation Support Activity, JASA)

**Ron Ketcham** (Naval Air Warfare Center/Weapons Division)

**Robert O. Lewis** (Boeing)

**Michael Metz** (IMC)

**Session B5: V&V (especially validation) for M&S which employ Adaptive Processing** such as AI, neural nets, genetic algorithms, fuzzy sets, etc. Adaptive processing poses special validation problems since sometimes M&S processes will change as the adaptive processing element "learns" and since it may not be possible to have an explicit understanding of why the M&S acted as it did.

Session Chairs:

**Randall Shumaker** (U. of Central Florida Institute for Simulation and Training)  
**Bernard P. Zeigler** (University of Arizona)

Session Recorder: **David Gross** (Boeing)

Paper & Author:

*Verification and Validation and Artificial Intelligence* (71 pp)  
**Tim Menzies** (University of West Virginia)

**Session B6: V&V (especially validation) for M&S which employ Significant Aggregation.** M&S which employ significant aggregations (such as found in campaign models, many economic and logistical models, etc.) pose special V&V problems.

Session Chairs: **Andreas Tolk** (VMASC/ODU) and **Robin Miller** (UK MoD)

Session Recorder: **Bob Senko** (DMSO)

Paper & Authors:

*Implications of Metamodeling, Multi-Resolution Modeling (MRM), and Exploratory Analysis for Validation* (46 pp)  
**Paul Davis** (RAND)  
**Jim Bieglow** (RAND)

**Session T1: V&V Education in Academia** (items that should be covered, possible lesson plans, resources, where to insert V&V materials in computer science, engineering, science, and other curricula).

Session Chairs: **Virginia Dobey** (DMSO) & **David Luginbuhl** (Western Carolina U.)

Papers & Authors:

*The Role of Educational Institutions in Verification and Validation Preparation*  
**J. Desel** (Katholische Universität Eichstätt-Ingolstadt  
Lehrstuhl für Angewandte Informatik, Eichstätt, Germany)  
**P. Gray** (University of Northern Iowa)  
**R. Panoff** (Shodor Education Foundation, Inc.)  
**D. E Stevenson** (Clemson University)

**Session T2: Managing V&V** (addresses issues peculiar to V&V program management, including contracting, statement of work development and management, use of Integrated Product/Process Teams, contract deliverables, V&V for simulations in development, and VV&A for simulations used to support test and evaluation).

Session Chairs: **Jamileh Soudah** (Dept of Energy ASCI V&V lead)  
**Marty Pilch** (Sandia National Laboratories)

Presentations & Authors:

*Managing a Verification and Validation Program – The Government Perspective* (26 slides)

**Boots Barnes** (JWARS Office)

*Managing a Verification and Validation Program – The Contractor’s Perspective* (24 slides)

**Mike Metz** (IMC)

*TOMAHAWK Simulation Management* (24 slides)

**Kem White** (JHU/APL)

*Managing the STORM V&V Program* (35 slides)

**Dave MacKay** (IMC)

Panel Discussion of V&V Management:

**Boots Barnes** (JWARS Office)

**Dave MacKay** (IMC)

**Mike Metz** (IMC)

**Kem White** (JHU/APL)

**Wendy Winner** (Army Research Laboratory)

### **Session T3: V&V Research.**

Session Chairs: **Bob Thomas** (Sandia National Laboratories)  
**Hessam Sarjoughian** (Arizona State U.)

Papers & Authors:

*Formalization and Validation: An Iterative Process in Model Synthesis* (18 pp)

**Joerg Desel** (Katholische Universität Eichstätt-Ingolstadt  
Lehrstuhl für Angewandte Informatik, Eichstätt, Germany)

*A Proposed Evolution of Validation Definition* (7 pp)

**Daniel Girardot** (French Centre d'Analyse de Défense)  
**René Jacquart** (ONERA, French research institution for Aeronautics & Space)

*A Case Study of Verifying and Validating an Astrophysical Simulation Code* (43 pp)

**A. C. Calder** (U. of Chicago)  
**B. Fryxell** (U. of Chicago)  
**T. Plewa** (U. of Chicago & Nicolaus Copernicus Astronomical Center, Poland)  
**R. Rosner** (U. of Chicago)  
**L. J. Dursi** (U. of Chicago)  
**V. G. Weirs** (U. of Chicago)  
**T. Dupont** (U. of Chicago)  
**H. F. Robey** (Lawrence Livermore National Laboratory)  
**J. O. Kane** (Lawrence Livermore National Laboratory)  
**B. A. Remington** (Lawrence Livermore National Laboratory)  
**R. P. Drake** (U. of Michigan, Ann Arbor)  
**G. Dimonte** (Lawrence Livermore National Laboratory)  
**M. Zingale** (U. of Chicago & U. of California, Santa Cruz)  
**A. Siegel** (U. of Chicago)  
**A. Caceres** (U. of Chicago)  
**K. Riley** (U. of Chicago)  
**N. Vladimirova** (U. of Chicago)  
**P. Ricker** (U. of Chicago & U. of Illinois)  
**F. X. Timmes** (U. of Chicago)  
**K. Olson** (U. of Chicago, UMBC, & NASA)  
**H. M. Tufo** (U. of Chicago)

*Model Validation Methodology from Validation Experiments to Systems Level Application* (18 pp)

**Richard G. Hills** (New Mexico State University)  
**Ian Leslie** (New Mexico State University)

*Accreditation Issues for Verification and Validation of the Prototype Federation for the Joint Synthetic Battlespace* (28 slides – presentation only)

**Lt Col Emily Andrew** (USAF)  
**Gerald Pritchard** (Dynetics)  
**Jeffrey Wallace** (Envoy Tek)

#### **T4: V&V Issues and Implications for M&S Reuse.**

Session Chairs: **Jim Weatherly** (Navy Modeling and Simulation)  
**John Illgen** (Illgen Simulation Technology)

Papers & Authors:

*Verification and Validation Issues and Implications for Reuse* (23 pp)  
**John McGregor** (Clemson University)

*Implementing a Reuse Strategy Across Multiple Domains* (11 pp)  
**Sarah Aust** (Naval Air Warfare Center/TSD)

**T5: Formal Systems and Their V&V Utility.** This session has been combined with Session A5 and will be held in conjunction with it. See Session A5 for description

#### **Session T6: V&V Tools, Templates, and other Resources**

Session Chairs: **Jennifer Park** (Navy Modeling and Simulation Management Office)

Session Recorder: **Michelle Bevan** (MSIAC)

Papers & Authors:

*Overview of VV&A Tools, Templates, and Resources* (10 pp)

*Automated Support Tools for Verification, Validation, and Accreditation* (31 pp)

*VV&A Templates and Resources* (10 pp)

**Jerry M. Feinberg** (Modeling & Simulation Information Analysis Center)

**Patrick W. Goalwin** (Modeling & Simulation Information Analysis Center)

**Session T7: V&V Policies, Guides, Handbooks, and Standards** (within the Defense community and from other authorities such as DOE/ASCI program, professional societies, etc. The purpose is to identify what these alternative agencies are, where they apply, how they differ, etc.).

Session Chairs: **Susan Solick** (US Army/TRAC)  
**Marcia Stutzman** (Northrop Grumman Information Technology)  
Session Recorder: **François Hemez** (Los Alamos National Laboratory).

Papers & Authors:

*Codes, Standards, Recommended Practices, and Guides of Engineering & Scientific Professional Societies: Application to Verification & Validation in Computational Engineering* (27 pp)

**Len Schwer** (Schwere Engineering and Consulting)

*Department of Defense M&S VV&A Policy and Guidance* (77 slides – presentations only, contains all slides used by authors below)

**Simone Youngblood** (DMSO VV&A Technical Director)

**Susan D. Solick** (TRAC-FLVN)

**Sam Johnson** (USAF XIWM)

**Jennifer Park** (NAVMSMO)

*Accrediting Complex M&S for an Analysis of Alternatives: A Successful Approach* (11 pp)

**Lynda Liptak & Peter Delinski** (USAF Office of Aerospace Studies)

**Session T8: V&V Education in the Workplace** (on the job training, short courses, resource materials, etc.).

Session Chairs: **Kenneth “Crash” Konwin** (Booz Allen Hamilton)

**James Coolahan** (JHU/APL)

Session Recorder: **Kara Scott** (Booz Allen Hamilton)

Presentations & Authors -- Content Lead: **Jim Skinner** (AEgis Technology Group):

*V&V Education in the Workplace* (12 slides)

*DoD M&S VV&A Resources* as they pertain to teaching V&V in DoD (20 slides)

Briefed by **Marti Hoppus** (JASA, Naval Air Warfare Command Weapons Div.)

*What Does Industry Want from VV&A Training? A Preliminary VV&A Use Case for Aerospace* (20 slides)

**Bill Tucker** (Boeing)

*Lessons Learned from Development and Teaching of a Short Course in Statistical Quality Control for Measurement Uncertainty* (7 slides) [T8B\_hemsch]

**Mike Hemsch** (NASA Langley Research Center)

Panel Discussion of V&V Education: *What's Missing and How Do We Get There?*

**Pat Cannon** (AEgis Technology Group)

**Marti Hoppus** (Naval Air Warfare Command Weapons Division)

**Jim Skinner** (AEgis Technology Group)

**Mike Hemsch** (NSAS Langley Research Center)

**Bill Tucker** (Boeing)

## Room & Session Assignments (as of October 15, 2002)

All sessions will be on the ground floor of the Kossiakoff Center. All plenary sessions will be in the auditorium. Rooms for the sessions on Tuesday afternoon and Wednesday morning are shown in the table below. Please attend the sessions to which you are assigned. Session assignments are listed in the table after the rooms.

### **Tuesday Afternoon** **Session Code --Room**

A1 – K3  
 A2 -- Auditorium  
 A4 – K8  
 A5/T5 – K5  
 A6 – K6  
 T1 – K1  
 T2 – K2  
 T4 – K4  
 T7 – K7

### **Wednesday Morning** **Session Code --Room**

B1 – Auditorium  
 B2 – K5  
 B3 – K6  
 B4 – K8  
 B5 – K1  
 B6 – K2  
 T3 – K7  
 T6 – K8  
 T8 – K3

### **Session Assignments** (as of October 15<sup>th</sup> -- Participants are listed alphabetically)

<b>Last</b>	<b>First</b>	<b>Tues.</b>	<b>Wed.</b>	<b>Last</b>	<b>First</b>	<b>Tues.</b>	<b>Wed.</b>
Aboutalib	Omar			Cafeo	John	A2	B1
Allen	Gene			Calder	Alan	T1	T3
Alonso	John			Carr	John	A1	B1
Anderson	Mark	A2	B1	Catts	Erwin		
Andrew	LTC Emily	A1	T2	Cavendish	James	A2	B1
Arvelo	Juan	T7	T6	Cerri	Anthony	A4	B3
Aust	Sarah	T4	B6	Chandramouli	Ranaswamy	A5	T3
Baker	Rosser	A2	B2	Christakos	John	A5	B4
Bayarri	M.j.	A2	B1	Coleman	Hugh	A2	B1
Berger	James	A2	B1	Coolahan	James	A2	T8
Bernstein	Richard	A5	B4	Coombs	Marcus	A5	T3
Bevan	Michelle	T4	T6	Cox	William	T2	B3
Bigelow	James	A2	B6	Craigen	Dan	A5	T3
Blackert	William	A5	B2	Crandall	David	Keynote	Keynote
Blair	Tommy	A4	B1	Cronk	Andrew	A2	T6
Blankenship	Edward	T7	T8	Curry	David	A2	B2
Bort	David	A1	B2	Desel	Jörg	T1	T3
Bouc	Pierre	A2	B3	Dillard	Archie	T2	B3
Bowers	Bill	A4	B4	Dobey	Virginia	T1	B4
Boyette	Joanna	T4	T3	Doebling	Scott	A2	B1
Brade	Dirk	A5	B4	Dowding	Kevin	A2	B1
Breitler	Alan	T7	T6	Doyle	Edward	A4	B2
Breznik	Clay	A4	B2	Dunn	William	A4	B6
Burbank	Jack	A6	B2	Easterling	Robert	A2	B1

<b>Last</b>	<b>First</b>	<b>Tues.</b>	<b>Wed.</b>	<b>Last</b>	<b>First</b>	<b>Tues.</b>	<b>Wed.</b>
Elmo	Joseph	A2	B4	Liptak	Lynda	T7	B4
Feather	Martin	A5	T6	Little	Reed	A1	
Feinberg	Jerry	A2	T6	Logan	Roger	T2	B4
Figart	Grayden	T7	B2	Lowman	Raymond	T7	T6
Finnern	Michael	T1	T8	Luckring	James	A2	B1
Francis	Cathryn	T7	T8	Luginbuhl	David	T1	T3
Fritz	David	T2	B4	MacKay	David	T2	B6
Geipe	Timothy	A2	B1	MacKenzie	Garth	A1	B4
Ghanem	Roger	A2	T3	Mair	Hans	A6	B1
Goalwin	Patrick	A2	T6	Marthaler	Anthony	T4	T3
Gover	Robert	A2	B2	Martin	Brad	A5	
Graebener	Robert	A4	B2	Matthews	Paul	A2	B4
Gray	Paul	T1	T8	May	Waits	A4	B6
Greenaugh	Kevin	A2		Mccray	William	T7	B4
Gregg	Donna	A5	B2	McEniry	Robert	T7	B4
Gross	David	A2	B6	Mcgregor	John	T4	B5
Hall	David	A4	B4	McKay	Michael	A2	B1
Hall	Shannon	A2	T8	McVee	John	T7	B1
Harmon	Scott	T4	B3	Mehta	Unmeel	A2	B1
Hasselman	Timothy	A2	B1	Menzies	Tim	A2	B5
Hemez	Francois	T7	B1	Metz	Michael	T2	B4
Hemsch	Michael	A2	B1	Meyer	Megan	T7	T6
Hester	Joshua	A4	B2	Miller	Robin	A4	B6
Hilgarth	Peter	A2	T6	Molyer	Orhun	T2	T6
Hills	Richard	A5	T3	Morishige	Ronald		
Hilterbrick	Scott	A5	B2	Morrison	Joseph	A2	B1
Hirsch	Charles		B1	Moulding	Michael	A6	
Hodge	Don	T2	B4	Moy	Dennis		B4
Hoffman	Camillus	A4	B3	Nitta	Cynthia	T2	B4
Hone	Geoffrey	A6		Numrich	Sue	A2	B3
Hoppus	Marti	A4	T8	Oberkampff	William	A6	B1
Hudson	Susan	A2	B1	Olson	Linda	T7	T6
Illgen	John	T4	T3	Ormsby	Bill	A6	B2
Jacquart	Rene	A5	T3	Pace	Dale	A4	ADMIN
Johnson	Sam	T7	B6	Paez	Thomas	A2	B1
Kemp	Jesse	A2	B3	Painter	Steve	A6	B1
Kennedy	Ken	A1	T3	Panoff	Robert	T1	B5
Kilikauskas	Michelle	A2	B4	Park	Jennifer	T7	T6
Kirschenbaum	Susan	A4	B3	Parry	Philip	T7	T6
Kniphfer	Jerry	T7	T6	Pearson	John	T4	B2
Koester	Andreas	A5	B3	Pettit	Chris		
Konwin	Kenneth	A5	T8	Pilch	Martin	T2	B1
Kovalchik	Joe	A4	B6	Pleva	Paul	A6	B4
Kuhn	David	T2	B4	Pollack	Ann	A5	T8
Langer	Kristina	A2	T3	Price	Sean	A5	T3
Larsen	Kimberly	A1	T8	Raitch	Ted		
Leitch	David D.	T7	B2	Riley	John	A2	B2
Leslie	Ian	A2	T3	Rose	Ollie	A2	B1
Lewis	Robert	A5	B3	Rosenberg	Linda	A1	Keynote

<b>Last</b>	<b>First</b>	<b>Tues.</b>	<b>Wed.</b>	<b>Last</b>	<b>First</b>	<b>Tues.</b>	<b>Wed.</b>
Rutherford	Brian	A2	B1	Stutzman	Marcia	T7	B2
Sacks	Jerome	A2	B1	Tasto	Joseph	T2	T6
Sanders	Larry	A2	B3	Taylor	Thomas	A2	B1
Sarjoughian	Hessam	A6	T3	Thacker	Ben	A2	B1
Saunders	Randy	T4	B3	Thai	Bea		
Schwer	Leonard	T7	B1	Thomas	Robert	A1	B1
Scott	Kara	T1	T8	Thomen	David	A6	T8
Senko	Robert	A4	B2	Tolk	Andreas	T7	B6
Sheehan	Jack	A4	B6	Tu	Jian	A2	B1
Shepherd	Seth	A4	B2	Tucker	William	A5	T8
Shields	Marcia	A1	B2	Tyler	John	T4	B3
Shook	Tom	T7	T6	Veley	Duane	A2	B1
Shumaker	Randall	A6	B5	Waite	William	A4	B2
Silberglitt	Michael	A2	T6	Walker	Eric	A2	B1
Skinner	James	T1	T8	Weirs	V Gregory	A6	B1
Smale	John	A4	B6	White	Donald	T2	B4
Smith	James	A1	B5	Winner	Wendy	T2	B1
Snyder	Eric	A2	B4	Wolk	Sheldon	A2	B2
Solick	Susan	T7	B6	Yang	Ren-jye	A2	B1
Soudah	Jamileh	T2	B1	Yeakel	William	T2	T6
Steele	W. Glenn	A2	B1	Yilmaz	Levent	A1	T3
Stevens	William	A5	B5	Youngblood	Simone	T7	B1
Stevenson	D.	T1	T3	Zang	Thomas	A2	B1
Stolarik	Brian	A1	B5				

# Foundations '02 Leaders & Keynote Speakers

## Foundations '02 Leadership

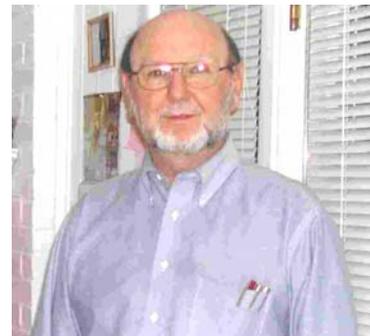
General Chair: **Simone Youngblood** (DMSO)

Program Co-chairs: **Dale Pace** (JHU/APL) and **Steve Stevenson** (Clemson)



**Simone Youngblood** is a member of the Principal Professional Staff at the Johns Hopkins University Applied Physics Laboratory (JHU/APL). For the past five and a half years, Ms. Youngblood has served as the DoD VV&A focal point in her position as DMSO's VV&A Technical Director. Leveraging an extensive background in simulation development, modification and application, Ms. Youngblood has been active in the VV&A community for the past ten years. Ms. Youngblood is active in numerous organizations which focus on VV&A. From 1994 to 1997, she served as Chair of the DIS VV&A Sub-Group and was co-author and editor of the IEEE 1278.4 "Recommended Practices Guide for Distributed Interactive Simulation - Verification, Validation, and Accreditation." From 1997 to the present, Ms. Youngblood has served as the chair of the SIW VV&A Forum. Ms. Youngblood is also active in the Society for Computer Simulation and the Military Operations Research Society. Ms. Youngblood has a BA in Mathematics as well as a BS and an MS in Computer Science.

**Dale K. Pace** is a member of the Principal Professional Staff of The Johns Hopkins University Applied Physics Laboratory and taught in Hopkins' graduate technical management program from the mid-1980s to the mid-1990s. Dr. Pace has led V&V endeavors within his own organization, at other Defense organizations, and across government departments. He has taught VV&A short courses for professional societies, government activities, and industry. He was an initial co-chair of the Distributed Interactive Simulation (DIS) VV&A group and was co-chair of the Military Operations Research Society (MORS) Simulation Validation (SIMVAL) 1999 Workshop. He is a member of the Defense Modeling and Simulation Office (DMSO) Verification, Validation, and Accreditation (VV&A) Technical Working Group and its VV&A Technical Support Team. He is *Simulation's* Associate Editor for Validation.



**Professor D. E. Stevenson** (know as 'Steve' by everyone) received an A. B. in mathematics from Eastern Michigan in 1965, an M. S. in computer science from Rutgers in 1975, and a Ph. D. in mathematical sciences from Clemson in 1983. He is currently an associate professor of computer science at Clemson. He spent eleven years as an MTS at Bell Telephone Laboratories. He is a member of the ACM, Association for Symbolic Logic, and SIAM. Professor Stevenson's research interests center around computational science, primarily involving the question of the computational foundations for scientific models. One question is the mathematical validity centering in constructive mathematics and development of programs from these constructions. The focus of all this research is "How do you know it's right?" The second question is a people question: how to educate the diverse scientific community in computational science. He is active in education as a member of the Shodor Education Foundation.

## **Keynote Speakers**

**Anthony Cerri**, Experimentation Engineering Depart M&S Division Chief, Joint Forces Command  
*The Importance of Credible M&S for the Defense Community*

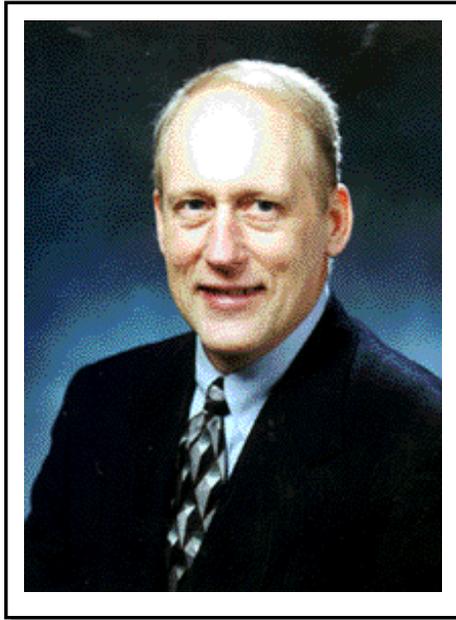
**David Crandall**, Dept of Energy Defense Programs  
*The Essential Role of Credible Correct Simulation in Assuring the Safety of America's Nuclear Stockpile*

**Linda Rosenberg**, NASA Chief Scientist for Software Quality Assurance)  
*Software Quality Assurance at*

**Randall Shumaker**, UCF Institute for Simulation and Training Director  
*The Road to the Future – How to Implement Needed Research*

**Tony Cerri** is a Navy civil servant and the Modeling and Simulation (M&S) branch chief for the United States Joint Forces Command, Joint Futures Lab, J9, located in Suffolk, VA. He is responsible to ensure the M&S environment supports futuristic Joint experimentation concepts. In this capacity, he acted as the M&S Federation Manager for the Millennium Challenge 02 experiment completed in July '02. Other major experiments wherein Tony has been similarly involved include; J9901 – the first J9 experiment, Attack Operations 00, Unified Vision 01. Prior to his current position, he was a senior system analyst with Science Applications International Corporation and part of a team that transitioned the Synthetic Theater of War Advanced Concept Technology Demonstration to the Joint Semi-Automated Forces simulation. Previous work in the corporate world includes developing an integration program for U.S. Army, training-focused, automated information systems. He is a retired U.S. Army, Infantry, Lieutenant Colonel. Military awards include the Legion of Merit and the Bronze Star. He was awarded a Bachelor of Science from West Point in 1975, a Master of Science in Administration from Central Michigan University in 1990 and a Master of Science in Management from Florida Institute of Technology in 1995.

*Dr. David H. Crandall*



Dr. Crandall is Assistant Deputy Administrator for Research, Development and Simulation, Office of Defense Programs at the National Nuclear Security Administration, U.S. Department of Energy. This is the principal office within the Department of Energy for nuclear weapons research in support of the Stockpile Stewardship Program. His experience includes 16 years of physics research and 20 years of science program management.

Dr. Crandall conducted experimental research from 1967 through 1983 investigating the physics of atomic collisions with emphasis on highly charged ions.

This research was conducted at the University of Nebraska (thesis research), at the University of Missouri at Rolla (visiting professor), at the Joint Institute for Laboratory Astrophysics in Boulder, CO (post doctoral fellow), and at the Oak Ridge National Laboratory (researcher and program manager), with over 100 refereed publications. The basic physics measurements and insights from this research are applied in the fields of plasma physics, fusion energy and astrophysics. Dr. Crandall is a Fellow of the American Physical Society cited for his work on atomic collisions involving multiply-charged ions.

Since 1983, Dr. Crandall has been at the U.S. Department of Energy in Washington, D.C. He served as Branch Chief for Experimental Plasma Research and as Division Director for Advanced Physics and Technology in the Fusion Energy Program within the Office of Energy Research. Beginning in 1988, in his capacity as Division Director, he led the implementation of the Tokamak Transport Initiative. In 1995, he joined the Office of Defense Programs where he served as Director of the Office of the National Ignition Facility, Director of the Office of Inertial Fusion, and Director of the Office of Defense Sciences. He began his current position in the newly established National Nuclear Security Administration on March 6, 2000.

## **Linda H. Rosenberg, Ph.D.**



Dr. Rosenberg serves as the Acting Assistant Director for Information Sciences / Chief Information Officer at NASA's Goddard Space Flight Center. She is matrixed from her position as Chief Scientist for Software Assurance for Goddard Space Flight Center (GSFC), NASA in the Office of Systems Safety and Mission Assurance Directorate and is the former division chief of the Software Assurance Technology Office (SATO). Dr. Rosenberg is a recognized International expert in the areas of software assurance, software metrics, requirements and reliability and serves on IEEE program committees in those areas. She has presented papers/tutorials and chaired sessions at many international conferences, included those sponsored by NASA, DOD, and AIAA. Dr. Rosenberg also serves as a reviewer for the Department of Defense sponsored conferences and other industrial organizations for software quality. Dr. Rosenberg is also an adjunct professor at University of Maryland, Baltimore for the Masters/Doctoral Program. Dr. Rosenberg holds a Ph.D. in Computer Science, an M.E.S. in Computer Science, and a B.S. in Mathematics. She is a member of Electrical and Electronic Engineers (IEEE), the IEEE Computer Society, the Association for Computing Machinery (ACM) and Upsilon Pi Epsilon.

## ***Dr. Randall P. Shumaker***



Dr. Shumaker is Director of the Institute for Simulation and Training (IST) at the University of Central Florida. With a staff of approximately 135 IST is among the largest groups in the US focusing on research in modeling and simulation. Prior assignments for Dr. Shumaker include Superintendent for Information Technology at the Naval Research Laboratory, Director of the Navy Center for Applied Research in Artificial Intelligence, and Program Element Manager for aircraft technology at the Naval Air Systems Command. He has wide experience in computer science and computer engineering, with particular interest in human-computer interaction, adaptive systems, and software assurance. He has lectured, taught and published on a wide variety of computing topic with particular focus on intelligent decision systems. He frequently serves as a senior advisor on information technology within the US Department of Defense and NATO. He holds a PhD in computer science from the University of Pennsylvania, a BSEE in electrical engineering and an MSE in computer engineering also from the University of Pennsylvania. Dr. Shumaker is a registered Professional Engineer, a Senior Member of the Institute of Electrical and Electronic Engineers (IEEE), a member of the IEEE Computer Society, the Association for Computing Machinery (ACM) and Sigma Xi.

## Program Errata

### Additional / Corrected Session Assignments

Hans Mair (IDA) will serve as recorder for Session A6.  
Sue Numrich will serve as co-chair for Session B3.

Andrew, LtCol Emily	A1	T3
Coombs, Marcus	A2	T8
Konwin, Kenneth	A5/T5	T8
Larsen, Kimberly	A1	T6
Lewis, Robert	A1	B3
Segrest, James	T2	B3
Senko, Robert	A4	B6 (Recorder)
Tyler, John	A4	B3
Weatherly, Jim	T4 (Co-Chair)	
Zang, Thomas	A1	T8