



Inside

IV&V: Celebrating with our Agency
9th ESMD Workshop ~ Story Telling at its Best
Balance ~ Training Champions



VIEW

INDEPENDENT VERIFICATION and VALIDATION FACILITY
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Front Cover Photo: Champions all—These seven astronauts take a break from training to pose for the STS-123 crew portrait. From the right (front row) are astronauts Dominic L. Gorie, commander; and Gregory H. Johnson, pilot. From the left (back row) are astronauts Richard M. Linnehan, Robert L. Behnken, Garrett E. Reisman, Michael J. Foreman and Japan Aerospace Exploration Agency's (JAXA) Takao Doi, all mission specialists. Reisman joined Expedition 16 as flight engineer after launching to the International Space Station on mission STS-123. Image credit: NASA

Inside Cover Photo: Create a caption; name the principles, the date and the event. An engraved space pen will be gifted to the first to send me a winning caption. (*e-mail address below)

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NASA Independent Verification & Validation Facility

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All submissions are subject to editing.
Next Submission Deadline: June 20, 2008

Fairmont, West Virginia



Dear Reader:

We are now well into the year 2008—a year that marks NASA's 50th anniversary. As we celebrate this milestone with our Agency, we also celebrate our fifteenth anniversary of executing NASA's Independent Verification and Validation Program (IV&V), as well as eight years of managing the Office of Safety and Mission Assurance's Software Assurance Research Program (SARP).

Our Agency has long been revered for great acts of heroism. But those who design, build and pilot the most amazing technology known to mankind, making us witnesses to once unimaginable successes, are *true champions—individuals and teams who have educated themselves and trained and mentored one another to not only succeed, but to build on success year after year, mission after mission.*

We celebrate our years of providing IV&V Services and software assurance Research to our Agency by dedicating ourselves anew to make the commitment and participate in the training required to become *true champions*. We will work to more clearly state our goals and more effectively reach them. We will approach our work as a learning and knowledge sharing community. And we will train ourselves and mentor one another to be among those in our Agency who are reaching to the very height of achievement.

I hope you will enjoy reading this, our first quarterly of 2008. Within its pages you will find stories about champions and championing causes. We begin with a brief message about the Services and Research programs we bring to the NASA table, and before you turn the last page you will get a glimpse of the dedicated effort put forth by members of our Outreach programs to inspire the next generation of heroes and champions.

Cordially,

Dr. Butch Caffall
Director

Champions win wars, business share, campaigns, and titles - they carry the ball for the long haul. Heroes win battles or avert disaster - they carry the ball for a short while. Heroes will succumb to either adversarial champions or forces that have the odds against the heroics.

A dependency on heroics is a dependency on continued miracles to achieve the long-haul success. A dependency on developing champions and the environment for champions to thrive will greatly increase the chances of success.

Dr. Butch Caffall



15 Years of IV&V Services

As NASA celebrates its 50th anniversary, we celebrate our own contributions to the Agency's successes. Our fifteenth year as an Agency Program finds us in a time of heightened energy as the NASA IV&V Program focuses its efforts on revolutionizing the Agency's approach to software independent verification and validation.

The NASA IV&V Program has evolved from primarily performing verification and validation on human missions to focusing on all critical and safety-related Agency software for high priority missions. For the past several months we have endeavored to create a well defined and well communicated path—working together to identify the characteristics of NASA's IV&V Program success from the customer/stakeholder perspective and the periodic measures that will highlight those characteristics and lend confidence in the NASA IV&V Program.

Established in 1993 under NASA's Office of Safety and Mission Assurance (OSMA) and as the flagship of West Virginia's high technology park, it has been IV&V's mission to ensure the safety and success of all NASA activities for Agency-wide safety, reliability, maintainability, and quality assurance in support of the six Agency strategic goals (as documented in the NASA Strategic Plan), as well as NASA's goal to achieve managerial and institutional excellence comparable to the Agency's technical excellence.

Forty-three civil service employees and approximately 145 Full Time Equivalent (FTE) contractors on-site and 61 FTE contractors off-site formed an impressive team of experts. L-3 Communications Titan Corporation and Northrup Grumman Information Technology, principal contract suppliers of IV&V services, contribute value added/needed service to the projects upon which IV&V works ensuring a positive return to NASA on investment in software verification and validation.

The NASA IV&V Program exists to provide an additional level of assurance for NASA's critical missions that involve human safety or other core Agency objectives. Mission objectives are assigned to NASA Centers based on their expertise. The details of the technical analyses provided by the NASA IV&V Program's IV&V Services vary from project to project, and are tailored to the specifics that make each NASA project unique. What does not vary is our commitment to the safety and success of the projects we support.

The IV&V Services strives to improve software safety, reliability, and quality of NASA programs and missions through effective applications of systems and software IV&V methods, practices, and techniques. The IV&V Services includes all aspects of delivering the highest quality, state-of-the-art, IV&V services to its customers. For each IV&V project, our goal is to objectively answer the following three questions:

- ◆ *Does the software exhibit behaviors exactly as intended?*
- ◆ *Does the software not exhibit behaviors that were not intended?*
- ◆ *Does the software exhibit expected behaviors under adverse conditions?*

During our analysis efforts, we provide information to NASA Project Managers to assist them in gauging their progress towards achieving their goals and objectives. At various critical points during the project's development, the NASA IV&V Program provides assessments of software readiness for use to both the project's management and to our management in the OSMA. Thirty years of software industry experience, research, and reports indicate that the cost of software rework can



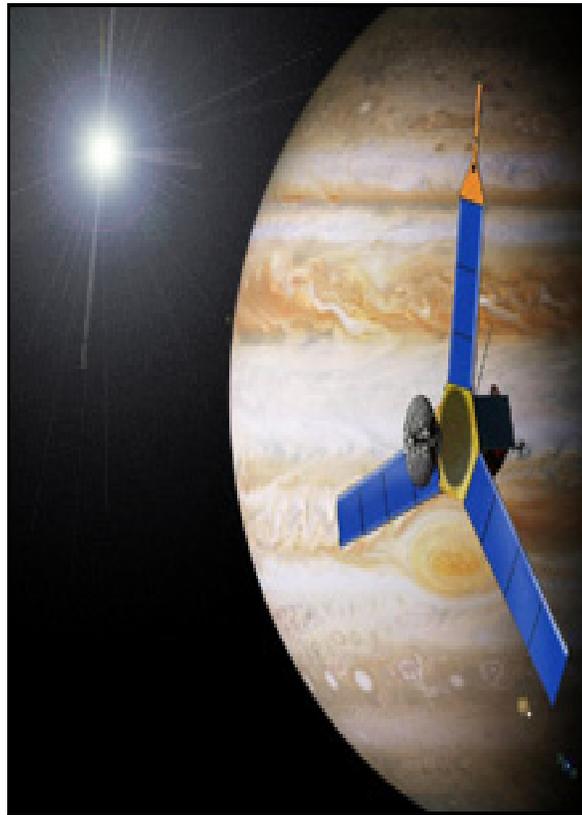
approach fifty percent for large software projects. Additionally, finding and fixing requirement errors can consume seventy to eighty-five percent of total project rework costs. Defect phase containment is an extremely important aspect of software and systems engineering. Defect phase containment helps ensure that correct and reliable systems are delivered on time and within the costs allocated to the software efforts.

The NASA IV&V Program has already begun several initiatives to shift the pre-2007 IV&V philosophy to this new approach. Among those, full-life cycle IV&V

JUNO Led by IV&V Project Manager, Wes Deadrick, the Juno IV&V Team is in a position to provide full-life cycle IV&V for specific aspects of the Juno mission which includes validation of both the system and software requirements. To date, the Juno IV&V Team has performed validation on multiple levels of system requirements (with a specific focus on those system requirements that will be implemented in software) and is continually gaining data points that will allow us to assess our confidence in the system.

Requirements validation efforts on Level 2 (system) requirements resulted in a set of 11 observations. The most notable of which were recommendations for clarification and further development for two desired behaviors: Time-Tagging and Synchronization of downlinked spacecraft and instrument data; and, Layered Fault Protection. The project performed an initial review of the observations, expressed support of the analysis results, and indicated that even earlier involvement may have yielded increased benefits. The IV&V Team's ability to speak to our confidence, in terms of the capabilities and limitations of the system, is necessary for providing assurance for mission critical systems.

for the Juno Mission. All of our customers will quickly see a heavy focus on early life cycle validation. This creates a system reference model that clearly represents the system's intentions (e.g., requirements) and the associated activity diagrams. These products will help NASA IV&V Program project management ensure that the NASA IV&V Program will apply a risk-based focus to the most critical and challenging aspects of the software.



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8 Years of SARP Research

The Office of Safety and Mission Assurance entrusted its Software Assurance Research Program (SARP) to IV&V's management eight years ago. With a change in leadership we, just as IV&V Services, have been investing our effort and energy to toward refining our approach and our purpose.

As we shift toward a more applied focus, we re-define the program to deliver solutions to challenges in the software assurance and software engineering realms. SARP is an Agency-level program, and we must take an Agency-level view of our purpose and our work. We support OSMA and NASA by working with all of the Centers to identify those challenges and then engaging them in developing solutions so that our colleagues charged with developing and assuring the software on NASA's missions have the best information, the best methods, and the best tools possible.

SARP performs leading-edge research that improves software assurance methods, practices, and tools, and directly supports OSMA's goals and NASA's missions. We serve OSMA by serving the work done at the Centers, but it is also essential that SARP maintain the big picture view of how a specific application can be generalized and applied more broadly. It is also with this big picture view in mind that SARP is collaborating with other programs that also have an Agency perspective such as the NASA Engineering Safety Center (NESC) and the NASA Safety Center (NSC).

Not only do we maintain an Agency-level view of the work we need to do, but we take a broad look at our purpose. Software Assurance isn't something that happens at the end of a project, it's not something tacked on at the last minute. It is part of all that is done throughout the lifecycle of a mission, and so very many people have responsibilities that support those critical functions. It is this broad community that we must engage and serve in order for us to fulfill our purpose to support OSMA and the Agency. And so it is gratifying that this year, in response to the SARP call for proposals, for the first time, *every NASA Center and Facility* provided input to Agency research needs. The resulting list is that which informs the research solicitation.

Aside from the obvious value of developing new methods and technologies, research provides other important benefits. Not only does our work support our position as technical leaders, but it helps us sharpen our own technical skills and requires us to understand and solve our own problems. The first challenge then, is to truly understand the fundamentals of the problem. Research has been described as "formalized curiosity—it is poking and prying with purpose." Thus, SARP supports that analytical, engineering, poking and prodding that is necessary to see beyond the immediate work to enable the kind of improvements we must have in order to achieve our long term goals.

If research is a whetstone on which the Agency sharpens our technical skills, it is imperative that SARP hones its management approach. To that end, we have undertaken an initiative to implement a research-focused Technology Readiness Level (TRL). In doing this, we have studied the work done by the Air Force as well as NASA, and are taking the best of those ideas to provide both the rigor and the flexibility that is necessary for the program. This will provide both a clearer path for researchers and greater confidence to those teams who collaborate with the program to evaluate, infuse, and apply research developed solutions.

OSMA SARP has pressing goals this year

- ◆ to introduce greater rigor and consistency into our technical approach to research;
- ◆ to gain more insight regarding stewardship and financial accountability; and,
- ◆ to demonstrate our value to the Agency.

In other words, SARP intends to follow the admonition of renowned British engineer, Sir Henry Royce (1863-1933): "Strive for perfection in everything you do. Take the best that exists and make it better. When it does not exist, design it."



As SARP hones its management approach on behalf of OSMA, we are collaborating with other teams and programs with a similar Agency-level view. One of these collaborations is with the NASA Safety Center. The NASA Safety Center will support and strengthen technical excellence over a wide range of NASA safety and mission assurance areas including system



safety, reliability and maintainability, quality engineering and assurances, and software assurance and risk management.

Because of the shared focus on the Agency's technical excellence, especially in regard to defining training that can sharpen the tools in our collective tool box, SARP is collaborating with OSMA and the NSC to provide training.

One of the training courses that will be offered to NASA Centers this year is *Perspective-Based Inspection*. The work behind this new pilot course has been developed and supported by SARP researchers. Since 2003, the SARP research team from the University of Maryland's Fraunhofer Center for Experimental Engineering, in collaboration with GSFC, has been studying the application of software inspections.

The SARP research team is now in a position to provide training to effectively apply perspective-based inspections. In addition, the training will detail the information necessary to make informed engineering decisions about the value of including perspective-based inspections in the assurance plans; how to staff that activity; and, the return on that investment in terms of defects found and corrected.

R E S E A R C H

Interested in the results of SARP initiatives?

Visit <http://sarpreresults.ivv.nasa.gov/>

IV&V Hosts 9th ESMD Risk and Knowledge Management Workshop

The Exploration Systems Mission Directorate (ESMD) conducted its 9th Risk and Knowledge Management (KM) Workshop in Fairmont, West Virginia, March 25-27. It was a great pleasure to welcome approximately seventy KM experts, training officers and education specialists from Headquarters and nearly all NASA centers, as well as participants from academia, private industry and the Department of Defense. The following is a synopsis from an article authored by David Lengyel, who led the workshop and is the Risk and Knowledge Management Officer within ESMD at NASA Headquarters. Dave has also held positions in the Shuttle-Mir and International Space Station programs; managed ISS's technical liaison office in Russia; and served as executive director of the Aerospace Safety Advisory Panel.

In a fast-paced, resource-constrained environment, we must budget our assets carefully to mitigate risks, while simultaneously capturing and transferring knowledge about risks. To accomplish this, ESMD risk and knowledge management practitioners use a set of interrelated risk and KM processes. One or, more likely, a combination of these practices will provide ESMD with a menu of options to enhance risk-informed decision-making in a measurable fashion. We have been careful not to over emphasize information technology (IT) in our approach which, in the past, has resulted in several "IT junkyards." We also hope to achieve more "learning through conversation" than before. The menu of options includes:

Pause and Learn (PAL) Modeled on the After-Action Review (AAR) used by the Army, and piloted by Dr. Ed Rogers, Chief Knowledge Officer at GSFC. The idea behind PAL is to create learning events at major milestones in the lifecycle of the project. Key attributes of PAL: informal discussion focused on tasks and goals; not for attribution approach; clear focus on particular area of project life (in terms of phase and function; maximum participation; timely approach—conducted inside a project's schedule.

Knowledge-Based Risks (KBRs) New approach to "lessons learned" designed to move away from a passive collection system that could be described as "collect, store and ignore." Improving the approach requires: start lessons learned early in project; capture and learn from successes; prevent failures, mishaps and near misses; increase utility and focus of existing Lessons Learned Information System; increase understanding of knowledge transfer mechanisms; flow all applicable lessons learned into requirements, processes, and plans and verify compliance;

institutionalize and standardize the use of lessons learned; provide resources, planning and management support to analyze and incorporate lessons learned—emphasizing the need for NASA and contractors to work together; capture the best lessons learned for a "living handbook" of best practices; screen new lessons learned for applicability, value and inclusion.

Web-enabled High-Performance Teams Team members constitute a significant knowledge base whose contributions can be lost through personnel downsizing, retirement, project transitions and career transitions. Our secure wiki is a good fit for mitigating risk by enabling the ESMD teams to collaborate on documents, conduct threaded discussions, manage calendars, locate process and expertise information and, most importantly, learn. ESMD has started to conduct wiki kick-off workshops to understand the social, communication and collaboration challenges in order to better fit the tool to team processes.

Knowledge-sharing Forums Knowledge sharing forums range from simple "brown bag" lunch seminars to large conferences. Knowledge sharing seminars and workshops might include past participants in NASA projects gathered to discuss experience and lessons learned; senior project leaders who share their insights; and other events that bring together project leaders from across NASA, private industry and other government agencies. A key goal is to record events that can be shared later with a larger audience, or an important audience that is unable to attend the original face-to-face.

Experienced-based Training Case studies, both internal and external to ESMD, are a powerful means of capturing and transferring relevant information to our management and workforce. The ESMD risk database guides us to case study candidate topics, as

The workshop was a milestone in the agency understanding how to address its' knowledge management issues.

Dave Lengyel, NASA ESMD

The workshop provided great working ideas for getting TRUE KNOWLEDGE (ground truth) that exists in the trenches escalated up and out so that everyone is aware of what is really going on. This came up when we discussed that knowledge was "sticky" and didn't move easily, it was local (stayed with the folks that had it) and didn't move easily.

Marcus Fisher, NASA IV&V Chief, Knowledge Management

risk and knowledge management practices and systems in a comprehensive manner that will accomplish more with less bureaucracy. The goal is not compliance with detailed processes and procedures, but rather, compliance with intent: the intent to learn and share and to probe multiple aspects of risk, so that ESMD's missions have the best possible chance of success.

To reduce risk and apply knowledge more effectively, ESMD is integrating its well as other organizations that might benefit from a case study. In future, ESMD will facilitate the development of case studies that will help transfer the context of a program, and the project decisions involved, to members of the workforce.

Knowledge Management: Story Telling at its Best

While planning to conduct the workshop at NASA IV&V, we discovered that knowledge sharing is somewhat of a family business for ESMD Risk and Knowledge Management Officer,

David Lengyel. His father, Coach Jack Lengyel, could not have faced a more difficult task of rebuilding a knowledge base when he became coach for the devastated Marshall football team after losing nearly its entire team in a plane crash—a story depicted in the movie *We Are Marshall*. A story near and dear to the hearts of those IV&Vers born and raised in West Virginia.



Jack Lengyel is a software executive and former sports official. He is best known as having been head coach of the Marshall University Thundering Herd football team from 1971 until 1974, having taken over following

the Southern Airways Flight 932 plane crash that killed nearly the entire team in 1970. He graduated from The University of Akron, where he was an assistant coach in 1959, and was a member of Lone Star Fraternity. He was an assistant coach at Heidelberg College (1961-62) and Cornell (1963-65) before becoming head football and lacrosse coach at The College of Wooster from 1966-1970.

Lengyel was hired by Marshall athletic director Joe McMullen after head coach Rick Tolley was killed along with most of the Marshall coaches and players in the crash. When Lengyel arrived at Marshall he was forced to recruit athletes from other sports (baseball, basketball and soccer) as well as allow a large number of walk-ons in order to rebuild the devastated football program. Although the team struggled in Lengyel's first season at the helm, it managed to win a stunning 15-13 victory over Xavier, scoring a touchdown on the final play of the game.

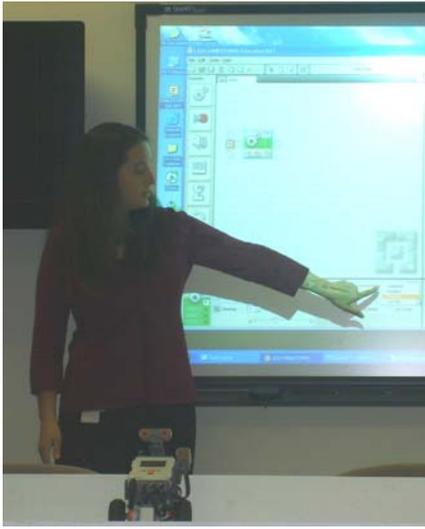
In 1988, he became the Athletic Director at the United States Naval Academy, where he served for 14 years before retiring in 2001. He received the 2005 John L. Toner Award from the National Football Foundation and College Football Hall of Fame for his service at Navy. Since retiring from Navy in 2001, he has also been the interim director of athletics at Temple University, Eastern Kentucky University, and most recently University of Colorado. Lengyel also served many years on the Board of Trustees at the United States Naval Academy. He is currently the vice president of business development for XOS Technologies, a provider of software solutions for sports programs.



Matthew McConaughey plays Lengyel in the film *We Are Marshall*, which was released on December 22nd, 2006. Lengyel and McConaughey at premiere.

On January 12th, 2008, seven members of a high school basketball team from Bathurst, New Brunswick, Canada and their coach's wife were killed in a highway crash when the 15-seat van they were traveling in collided with a tractor-trailer while returning from a game in Moncton in snowy conditions. Drawing similarities between the two tragedies, on March 13th, 2008 Jack Lengyel funded his own traveling expenses to New Brunswick, Canada to assist in counseling the grieving community.

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Marcie Raol, ERC Education Specialist, leading the first Robotics workshop at the NASA IV&V Facility Educator Resource Center

The *LOAN* Business is Booming at IV&V ERC

The NASA IV&V Facility Educator Resource Center is overwhelmed with activity—reaching educators as far away as McDowell County and as close to home as Rivesville Elementary School. You know about our great educator workshops, but did you know about all the equipment that is loaned free to educators? Our equipment loan program is unique to this ERC and it enables

educators to get Science, Technology, Engineering, and Mathematics (STEM) to students in hands on, tangible ways. Teachers receive training on equipment and ways to incorporate the equipment into their classroom and into lessons based on NASA

developed curriculum, then borrow it for free. This past quarter we have loaned equipment to 16 educational settings and trained 119 educators on topics with related kits.*

New news about NASA IV&V ERC equipment loan program! Partially funded through a recently awarded grant, pending revisions, from the WV Space Grant Consortium, the ERC will soon be developing robotics kits to loan to educators. Robotic kits will contain laptops with LEGO programming software, LEGO NXT Robots, activity materials, and educator guides for use in the classroom and afterschool programs. Come to the May 19th Brown Bag to hear about the details of the unique IV&V Educator Resource Center's Equipment Loan Program. Meanwhile, please

encourage the educators in your children's schools to participate in these exciting Spring Workshops!

*The ERC team would like to note that the success of the equipment loan program could not be accomplished without the great help from our security team. Often educators are picking up and returning equipment over the weekend and our security team continually receives praises around the state because of their assistance.

April 16-20 GLOBE Teacher wkshp Costa Rica Contact: Todd Ensign
WV GLOBE Trainers will travel to Costa Rica to conduct a teacher workshop in preparation for an international student learning expedition in August. We are working closely with the Costa Rica country coordinator for GLOBE and are funded by the Integrated Design for Geoscience Education (IDGE) NSF grant.

April 19 Rocketry Contact: Marcie Raol
What better to do on a beautiful spring day than launch rockets into the sky? This workshop at the NASA IV&V Facility is open to all educators, but designed for educators of 3-12 graders. Learn the science principles associated with rockets and find clear ties to math and science curriculum. Then test what you know (and learn some new things) about rocketry by building and testing pop rockets, bottle rockets, and air rockets.

April 25 Envirothon Competition Contact: Todd Ensign
The Educator Resource Center will provide a professional development workshop for the 40 Envirothon teachers while their student teams are running through the stations at their annual competition. The workshop will provide hands-on activities of the GLOBE Program's newest Earth System Science Program, Watershed Dynamics along with use of Pasco's environmental probeware to collect GPS, Dissolved Oxygen, conductivity, temperature, and pH simultaneously and the probeware's seamless connects to the MyWorld GIS software will be demonstrated.

April 28 Rocketry – notice date change Contact: Marcie Raol
NASA IV&V Facility will bring pop, bottle, and air rockets to Fellowship Elementary in Preston County. Educators from this school and around the county will gather to learn principals of rocketry and ties of rocketry in the classroom to math and science curriculum. Then their knowledge will be put to the test as we launch pop, air, and bottle rockets.

April 29 Engineering Design and Modeling Open House and Technology Showcase Contact: Todd Ensign
This open house will feature a hands-on engineering design lesson as well as a discussion on math and science integration. Attendees will have the opportunity to try the latest in 3D modeling software and to learn how it can be used to enhance student problem solving.

April 29 Aeronautics Contact: Todd Ensign
Although it is designed for educators of 5-12 graders, all educators are encouraged to attend. Explore how to teach the principles of lift through hands-on activities such as, with balloons, kites, and gliders, and use of NASA's FoilSim software.

May 7 Mars Contact: Marcie Raol
The educator's students will see (or be) astronauts on Mars; let's get them excited today. Visit the NASA IV&V Facility ERC this evening and learn Mars activities that both excite and educate. All educators are welcome to this workshop; however it was designed for educators of 3-8 graders. Plenty of hands on activities to teach lots of great science topics!

May 13-14 Regional ERCN Conference Contact: Todd Ensign
NASA Independent Verification & Validation Facility Educator Resource Center will be hosting the Langley Regional Educator Resource Center Network conference.

May 17 Robotics Contact: Marcie Raol
Take your classroom (or afterschool program) the next step in technology. Robotics can teach multiple science and math concepts as well as work on those soft skills vital to your student's future success. This workshop is designed for educators of 5-12 graders, but is open to all. Educators will experiment with LEGO NXT robots while learning the LEGO Mindstorms software and see the possibilities of using them in their classroom. This workshop will also certify educators to borrow our loan kits when complete.

May 27 Flight Simulations Contact: Todd Ensign
Educators will experience the Independent Verification & Validation Facility's own Shuttle Simulator that uses 8 computers, 3 projectors and an authentic shuttle cockpit interior. Also, learn to use free flight simulator software to teach concepts of flying in your classroom.

If you or an educator you know would like to participate in any of the ERC workshops, please contact Todd Ensign or Marcie Raol at erc@ivv.nasa.gov

This is the Generation of MARS and Beyond

Presenting in classrooms and in the community has brought about a realization that many of us take for granted. Working closely with professionals who help keep NASA running we are saturated with all things NASA. If you were to speak to just about any citizen, they might not be aware that NASA is retiring the space shuttle and replacing it with a new space transportation system. Furthermore the public has little clue as to the meaning of the letters in the acronym US Space Exploration Policy (USSEP) previously the Vision for Space Exploration (VSE). My goal as I enter the classroom or community venue is to shed light on the knowledge we take for granted.

When students and the public first hear about USSEP's goals, many are awestruck. They are excited to hear about a spacecraft that will travel further than an orbit around Earth. As my audience's eyes start to gleam I always wonder what it was like to experience the space programs that directly followed NASA's inception as a Federal Agency. I think I can begin to understand a little of the feeling that our country experienced as NASA sent men to the Moon for the first time.

Second to putting men on the Moon, the greatest impact felt from the Apollo Space Program was the formation of intellectual capitol by inspiring millions of students to pursue careers in science, technology, engineering, and mathematics. The USSEP's goals breathe new life into students' imaginations and provide opportunities similar to those experienced during

the Apollo era. The next generation of science, technology engineering, and mathematics professionals will take us back to the Moon, Mars and beyond, as well as improve the quality of life here on Earth. It is my daily objective to bring the spirit of exploration and discovery experienced long ago by a generation who watched NASA's nascent steps to and on the moon 50 years ago to students I meet today. I work hard to excite them about space science, earth science and exploration and, in turn, I hope they will be so excited that they will go home and revive that same excitement in their parents and grandparents. This past year I have had the privilege of talking to over 4,500 West Virginia students—from pre-K to college students—at grade school rocket launches and university career fairs.

What is the most common phrase I hear from students? "Wow! I didn't know that!" Well, that's my job—to make sure that they and their teachers (and, when they go home from school, their parents and their grandparents know) that NASA is still in the business of amazing scientific discovery and human and robotic space exploration. It's my job to look out over a sea of five year olds and fifteen year olds and twenty some-things and remember that I could be talking to the first person to step foot on Mars, or to build their home on the Moon, or, through NASA earth science, make the discoveries that will not only take us beyond our planet, but protect the planet we're on.



Jess White, Student Outreach Manager, catching the gleam in the eyes of Jayenne Elementary School students and their teachers.

Jerry Sims: finding balance — training champions

What does it take to become a champion? A look at how Jerry Sims spends his time away from the IV&V Facility can provide insight into exactly what it takes. Our IV&V team can be inspired by such an impressive value-driven approach to training, not to mention dedication and discipline. Jerry is the IV&V Program's project lead for LRO, GOES-R and deputy on JWST. This is the first in a series that IVView will bring to our readers in the coming months to illustrate that often the pursuit of our interests in our personal lives are often informed by the same values that undergird our professional commitment to our Facility's values.

Safety ~ Respect ~ Teamwork ~ Balance ~ Excellence ~ Innovation ~ Integrity

On May 29, 2006, my canine companion of the past eleven years unexpectedly passed on. Foster was a male Shepherd mix that was black and grey with the colorings of a dingo. He had the gentlest heart, was always happy, obedient and had an almost intuitive relationship with me. For several of the years before he passed, I professed that I wouldn't want the responsibility of another pet after Foster was no longer around. Despite my bluster, less than two months after he was gone, I was looking for a beautiful and intelligent dog to fill the space he left. What I got was not exactly what I was looking for but was also so much more....

It was the beginning of autumn before I received an 8 week old male, solid black DDR and Belgian line German Shepherd from Jaspenshof kennels in Texas. Officially, to the AKC, he is known as "Pant vom Jaspenshof"; we decided to call him **Dunkel**. He descended from some great champions in the sport of Schutzhund and all of his traceable ancestry were and are working dogs. In short, what came home from the airport in Pittsburgh was an 8 pound puppy with a 20 pound attitude! (That ratio has never improved either....) Six months later, we decided that, Dunkel was going to need a companion to balance his life and lessen the onus on us for entertaining him. In July of 2007, along came "Gretel Du Nobel Nid", call name **Schuldi**. She was a beautiful black female pup from DDR and Belgian lines that flew here directly from a town outside of Brussels, Belgium. This may have lessened the need for entertaining the dogs but it drastically ramped up the amount of energy in the house and the need for discipline! These dogs will not just disobey; they will openly confront you, look for weakness, and try to make you back down. They not only needed discipline to contain their energy but needed focused outlets for their boundless energy. The dogs were always about ready to snap; as were we.

Finally, after months of searching for training opportunities and resources, we were referred to the newly formed Mountaineer Schutzhund Club. This group is based from the newly opened Creekside Kennels outside of Fairmont, West Virginia and is organized and led by Joe Gribben, a highly talented and experienced dog trainer. We could not have been luckier than we were when we stumbled across this incredible opportunity! This is now where we spend every available Saturday training and learning.



Jerry with Dunkel and Schuldi. Dunkel translates to "dark" in German. Schuldi is short for schuldig which translates to "guilty" in German—and Jerry says she usually is. (By the way, Jerry's name is also Germanic in origin and translates as "spear ruler.")

So, what is Schutzhund, and how has it helped my dogs get what they need out of life? Schutzhund is a working dog competition sport that focuses on developing and evaluating traits and characteristics that will improve the breed. In Europe, a Schutzhund title has been a required benchmark for allowing a dog to breed and continue its lineage. Here in America it is more of a sport than a formal qualification; although it is still an important part of the pedigree when demonstrating the quality of certain breeds. This sport is a place where dogs and their handlers can compete in local clubs and then can advance to regional, national, and international competition. It is an outlet, a purpose in life, and a job for dogs with high drive that definitely need one. Aside from these, it is a relationship building experience for a handler and their dog, and a forum through which one can understand the psychology of dogs and how to work around and through it. In addition to handling your own dog, you can decide to put on the bite sleeve.



and scratch pants of the helper and face the dogs in protection work. Here you learn how to test each dog and grow their confidence, obedience, stamina, ability, and strength; as well as develop your own. Helpers assume an unspoken responsibility not to hurt the dog psychologically or physically in what is an extremely fast contact sport. You need to give up your ego, learn from the critiques on the sideline, and set the dog up for success!

What do the dogs need to learn to prepare for these Schutzhund competitions? There are 3 main phases of the test: The **tracking phase** includes a temperament test by the overseeing judge to assure the dog's mental soundness. When approached closely on a loose leash, the dog should not act shyly or aggressively. The track is laid earlier by a person walking normally on a natural surface such as dirt or grass. The track includes a number of turns and a number of small, man-made objects left by this person on the track itself. The handler follows the dog, which is expected to scent the track and indicate the location of the objects. The tracking phase is intended to test the dog's trainability and ability to scent, as well as, its mental and physical endurance.

The **obedience phase** includes a series of heeling exercises, some of which are closely in and around a group of people. During the heeling, there is a gun shot test to assure that the dog does not openly react to such sharp noises. There is also a series of field exercises in which the dog is commanded to sit, lie down and stand while the handler continues to move. From these various positions, the dog is either recalled to the handler or must wait in position until the handler returns and issues further commands. With dumbbells of various weights, the dog is required to retrieve on a flat surface, over a one-meter hurdle and over a six-foot slanted wall. The dog is also asked to run in a straight direction from its handler on command and lie down on a second command.

Finally, each dog is expected to stay in a lying down position away from its handler, despite distractions, at the other end of the obedience field, while another dog completes the above exercises. The obedience exercises demonstrate the most important skill, as the dog cannot succeed in the other phases without this ability.

The **protection phase** tests the dog's courage, physical strength and agility. The handler's control for the dog is absolutely essential to the safety of the dog, the handler, and the helper. The exercises include a search of hiding places, finding a hidden helper, and guarding that helper while the handler approaches. The dog is expected to pursue the helper when an escape is attempted, bite, and then to hold the grip firmly. The helper is searched and transported to the judge with the handler and dog walking behind and later at the helper's right side. When the decoy

attempts to attack the handler, the dog is expected to stop the attack with a firm grip and no hesitation. The final test of courage occurs when the decoy is asked to come out of a hiding place by the judge from the opposite end of the trial field. The dog is sent after the decoy when he refuses to listen to the handler's command to stop. The decoy then runs directly at the dog threatening the dog with a stick. All grips during the protection phase are expected to be firmly placed on the padded sleeve and stopped on command and or when the decoy discontinues the fight.

How's it all working out? My dogs are happier and have much more balanced lives. They endure the obedience work, crave the bite work, and rest well when we get home from training. I understand what's going on in their minds and can trust them to react appropriately in either the company of young children or that of menacing intruders. **Dunkel and Schuld** understand and accept that they are **accountable for their actions** and are eager to earn my approval. We're not ready for competition yet, but hope to be later this year. My dogs and I both enjoy the learning, growing, and bonding that we get from every training session and look forward to what will happen next week!

Prior to achieving eligibility for Schutzhund competition, the dogs must pass a BH (Begleithund) test. This is an initial evaluation of the dog's temperament, obedience, and ability to perform under stress and with distraction. It involves on and off lead obedience in an open field, around groups of people, and around bicycle and automotive traffic. After BH qualification, there are three levels of the Schutzhund test for which titles can be earned. For **Schutzhund I** the dog must heel on and off leash, demonstrate the walking sit, the walking down, and the stay tests, as well as, the send-out. It must retrieve on the flat and over a hurdle. In tracking, it must be able to follow a track laid by its handler at least 20 minutes earlier. Then the dog must perform protection tests and bitework to demonstrate courage and skill. For **Schutzhund II** the Schutzhund I qualified dog must again pass all of the obedience and protection tests required for the Schutzhund I degree, but those tests are made more difficult and require greater endurance, agility, and above all, control. There is an additional retrieve required over the six foot slanted wall. In tracking, the Schutzhund II candidate must be able to follow a track laid by a stranger at least 30 minutes earlier. For **Schutzhund III** the Schutzhund II qualified dog faces the same tests, again made more difficult. All exercises in obedience and protection are demonstrated off leash. There is the addition of a walking and running stand. In tracking, the dog must follow a track that was laid by a stranger at least 60 minutes earlier. The track has four turns, compared with two turns for Schutzhund I and II, and there are three objects, rather than two, that must be found by the dog. A dog can compete at any level that it is qualified for in order to either advance its title and qualifications or to improve its scores in any of the three areas. High scores can lead to competition at a higher level or potentially even a coveted Sieger rating.

Safety ~ Respect ~ Teamwork ~ Balance ~ Excellence ~ Innovation ~ Integrity

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Championing a Cause: *Swim for Life*



"When I reached 50 lengths, I was hungry and tired. I decided to do just 10 more lengths, and then just 10 more, again and again until I got up to 100 lengths. I learned that having a goal is good... and that I can do even better than I planned to."

A message from Matanya Solomon on behalf of the American Cancer Society and Fairmont Area Swim Team's: I swam a mile and a half, which is equivalent to 7,500 feet, which is equivalent to 2,500 yards, which is equivalent to 100 lengths, which is equivalent to A LOT and which is equivalent to a very tired kid. When I practiced I did 32 lengths. I hoped to swim 50 lengths during the event. When I reached 50 lengths, I was hungry and tired. I decided to do just 10 more lengths, and then just 10 more, again and again until I got up to 100 lengths. I learned that having a goal is good and that I can do even better than I planned to. I am very proud of myself. Participating in "Swim For Life" helped me swim a lot more than I thought I could. I never thought that I could swim that far. I learned about cancer. I learned that every little bit can count, whether it is 10 more lengths or ten more dollars. The money I raised will help the American Cancer Society learn more about cancer and find ways to destroy it. The author, Matanya Solomon is the 11 year old son of our IV&V colleague Dan Solomon, Project Manager, OCO and Tools Lab and REATSS Lead.

I raised \$915, which is the most any kid has ever raised on my swim team. I went door to door in my neighborhood. My parents sent out e-mails. We contacted people that we hoped would be interested. Some of these people were



home school groups we participate in. Others were people from our synagogue, friends, my Dad's co-workers, and family. I got contributions from people I don't even know. Thank you.

Repeat Offender: Kaci Reynolds in MDA Lock-Up

Every year, the IV&V Facility takes part in the Muscular Dystrophy Association Lock-up. For the past four years, I have had the pleasure of representing the Facility at this event. For those not versed in this local charity event, the Lock-up is a one day event in which local business leaders (or designees) in the region agree to be 'arrested' for charity. The 'jailbird' is provided a 'bail' amount by the MDA. It is then up to the jailbird to generate bail money to ensure their timely release from 'jail'.

The MDA covers over 40 diseases, and 77.4% of every dollar collected is invested directly in research, services and education:

- \$25 Provides an annual flu shot
- \$85 Funds one minute of research
- \$100 Funds a support group session
- \$200 Covers an initial diagnosis clinic visit
- \$650 Sends one child to MDA camp
- \$750 Pays for a muscle biopsy and interpretation
- \$2000 Purchases a wheelchair, leg braces or communication device

I was arrested on February 13th at 2:00pm at the Facility. My bail was set at \$3300. Last year, we, as an organization were able to raise \$1575 for MDA, making us the second highest fund-raising organization in the region! I challenged us to be #1 in 2008. The MDA set a regional goal of \$27,650 – no small feat for only one day's work. I am pleased to announce that the MDA surpassed this goal by \$120, collecting a grand total of \$27,770! \$2,225 of that total was generously donated by IV&V Facility employees – both civil servants and contractors alike. This earned the Facility the distinction of topping the "Jerry's Grand Club" list, again being the second highest fund raising organization in the region. On behalf of the Muscular Dystrophy Association, I would like to extend thanks to all who have supported this drive in this year and in the past. In addition, I would like to thank Butch Caffall and Greg Blaney for their continued support of this event.



To up-the-ante this year, a 'Wall of Fame' was created so that all donors could proudly display a MDA sign with their name. All of the signs were displayed on the outside of my cubicle wall for all employees and visitors of the Facility to see. Additionally, a soup luncheon was awarded to the winners of the 'top donors' challenge. I would like to personally thank the winners (in alphabetical order): Pat Callis (NASA), Judi Connelly (NASA), Marcus Fisher (NASA), Jon Hammock (KeyLogic), Frank Huy (NASA), Lisa Montgomery (NASA), Delma Moore (NASA), Donna Ozburn (NASA), Scott Radabaugh (Galaxy Global), Pavan Rajagopal (GeoControl Systems), Joe Sallman (GeoControl Systems) and Eric Sylvania (KeyLogic).