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Title: Looking to the Future

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Looking to the Future

April 15, 2014

All Employee Meeting

Charlie McMillan

Key Topics for Today

- Safety, Security, and Ethics
- Geopolitical Backdrop
- Strategic Plan
- Shaping the Future

SAFETY, SECURITY, AND ETHICS

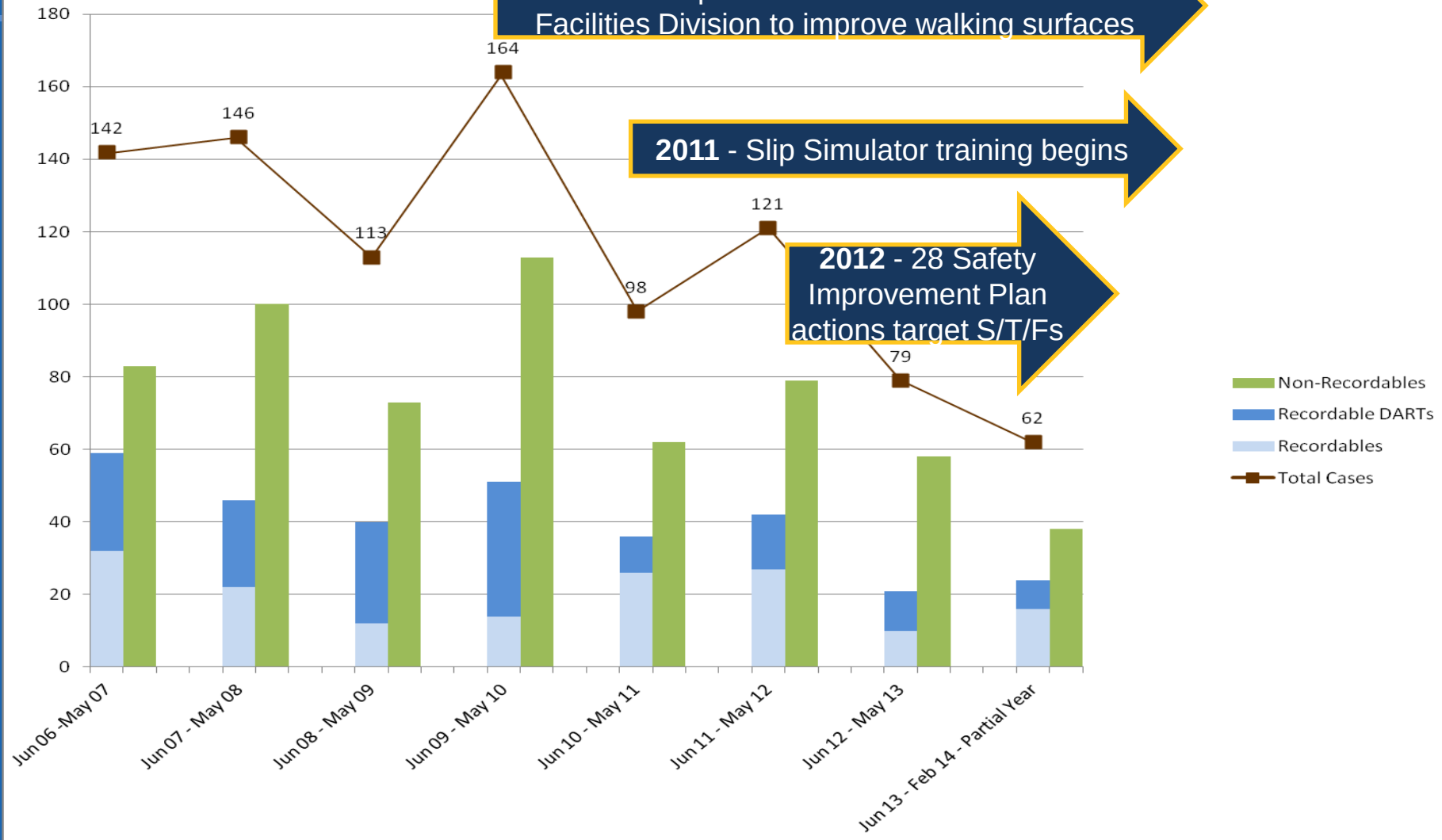
When We Maintain Focus, We Improve

Slip/Trip/Fall (S/T/F) Cases

2010–Workers partner with Utilities and Institutional Facilities Division to improve walking surfaces

2011 - Slip Simulator training begins

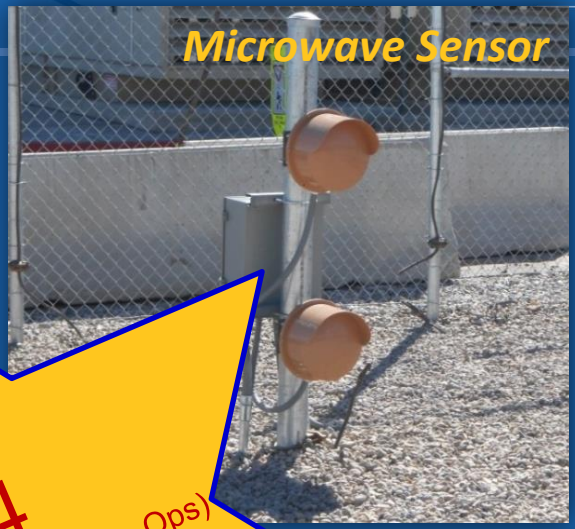
2012 - 28 Safety Improvement Plan actions target S/T/Fs



SAFETY

NMSSUP II - Operating and Protecting Assets

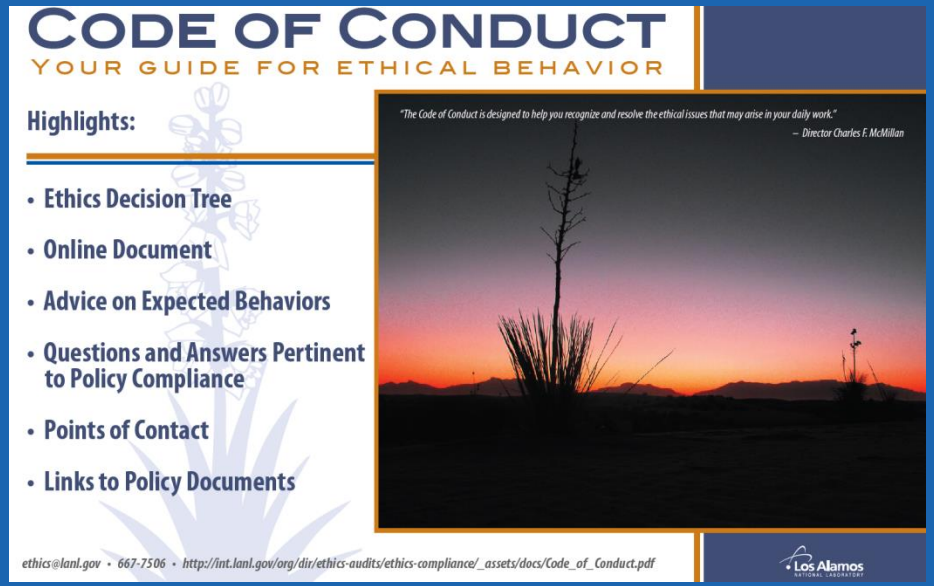
SECURITY



CD-4
(Project Closeout & Transition to Ops)
April 2, 2014

Ethics – Ingrained In All We Do

- We will hold ourselves to the highest standards
- We will follow best practices



The very *credibility* of Los Alamos National Laboratory is on the line

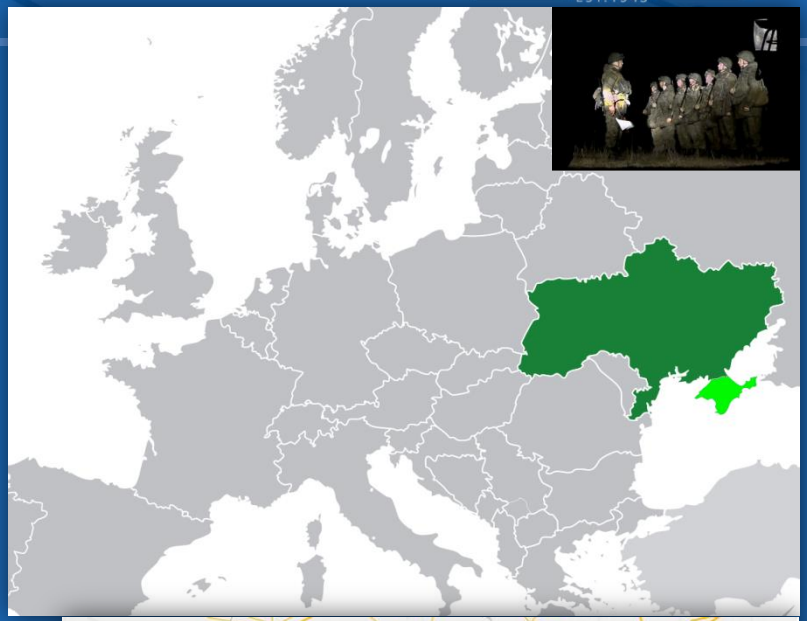
GEOPOLITICAL BACKDROP

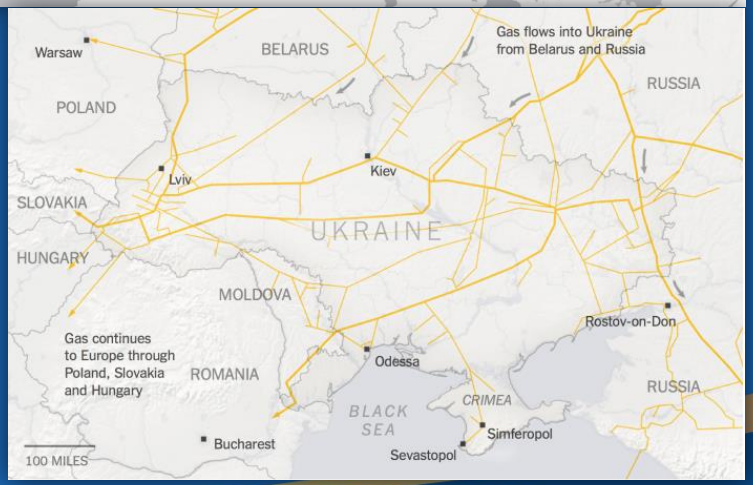
Geopolitics: Increasingly Fluid, Complex and Dangerous

- **Ukraine:** Russian incursion/ annexation of sovereign territories
  - Violation of '94 Budapest Agreement (US/UK/RF)
  - Continued threats to Ukraine & neighbors
- **Iran:** nuclear program & terrorism support
- **Syria:** civil war and dynamic diplomacy

Russia's aggression in Ukraine is a "wake-up call"

- Rasmussen, NATO Secretary General





East Asia: Emerging Conflict and Nuclear Ambitions

- **China:** Modernizing its nuclear and conventional forces
  - Making aggressive foreign policy and territorial claims
- **North Korea:** Continued Nuclear ambitions
  - Preparing for a "new-form" of nuclear test (?)
  - Significant (long-range) missile testing
  - Conventional provocations
    - Artillery shelling exchange

Allies watching Crimea, looking for assurances of U.S. guarantees

STRATEGIC PLANNING

Three Themes Lie Behind Our Strategic Plan:

1. We will deliver on commitments today while ensuring capabilities for an uncertain future
2. We will make Los Alamos National Laboratory one of the best places in the world to work
3. We will be a Laboratory that works seamlessly

Los Alamos Strategy Aligned with DOE and NNSA

Ernest Moniz
Secretary of Energy

DOE mission areas:

1. **National Security**
2. **Science**
3. **Energy**
4. **Environmental Management**

Frank G. Klotz,
New NNSA Administrator
Confirmed April 8

Moniz: All National Labs should be delivering these messages:

- DOE is a powerhouse of science and technology for the nation
- National labs are principal agents of execution on missions of national importance
- All of this is done in public service

Laboratory Strategy

Vision: Defines optimal state, ultimate contribution
Mission: Defines present state; tells what we do

- ***Vision:*** Delivering science and technology to protect our nation and promote world stability

- ***Mission:*** To solve national security challenges through scientific excellence

Values: Principles that Guide our Conduct

- **Service:** Serving our country, our partners, our community, and each other
- **Excellence:** Ensuring timely mission execution through scientific, operational, and business excellence
- **Integrity:** Building trust through intellectual honesty, ethical conduct, and individual responsibility
- **Teamwork:** Collaborating with colleagues and partners, respecting diverse opinions and backgrounds, vigorously debating alternatives, and coming together to achieve the best solutions
- **Stewardship:** Being good stewards of the taxpayers' dollars, the Laboratory, our community, and the environment
- **Safety and Security:** Ensuring that safety and security are integral to everything we do

Goals Leading to Action

Deliver national nuclear security and broader global security solutions

and

Foster excellence in science and engineering disciplines essential for national security missions

by

Attracting, inspiring and developing world-class talent to ensure a vital future workforce

and

Enabling mission delivery through next-generation facilities, infrastructure, and operational excellence

MISSION DELIVERY

Goal: Deliver National Nuclear Security and Broader Global Security Mission Solutions

- Strategies:
  - Maintain an effective U.S. nuclear deterrent;
  - Protect the nation against the nuclear threat through efforts in nonproliferation, counter proliferation, and counter terrorism;
  - Counter emerging threat and create new technology opportunities;
  - Leverage our core expertise to address energy security needs

Our core mission continues to be nuclear deterrence. Our nuclear expertise will be leveraged to serve the nation in multiple ways

Weapons Program is Delivering on Commitments

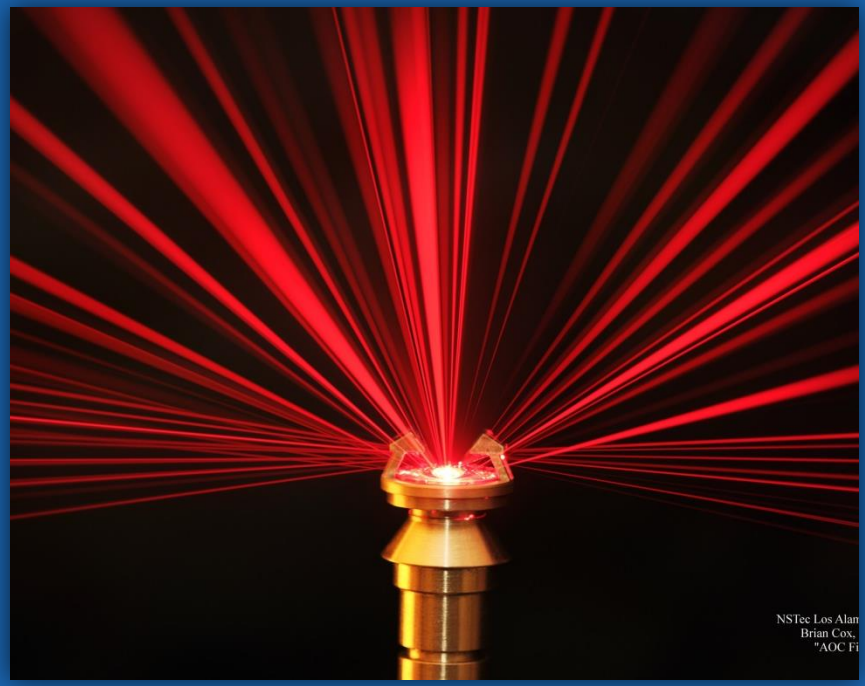
- B61-12 LEP
  - Successful hydrodynamic tests
  - New detonator development lot complete
- W88 Alt 370 Ongoing
  - Sub-critical scaled experiments

- Developed reuse concept and executed experiment
- Closed three significant findings
- Common system models are contributing to a strong annual assessment

Experiments Provide Detail That Allows Discrimination Among Competing Theoretical Models

MISSION DELIVERY

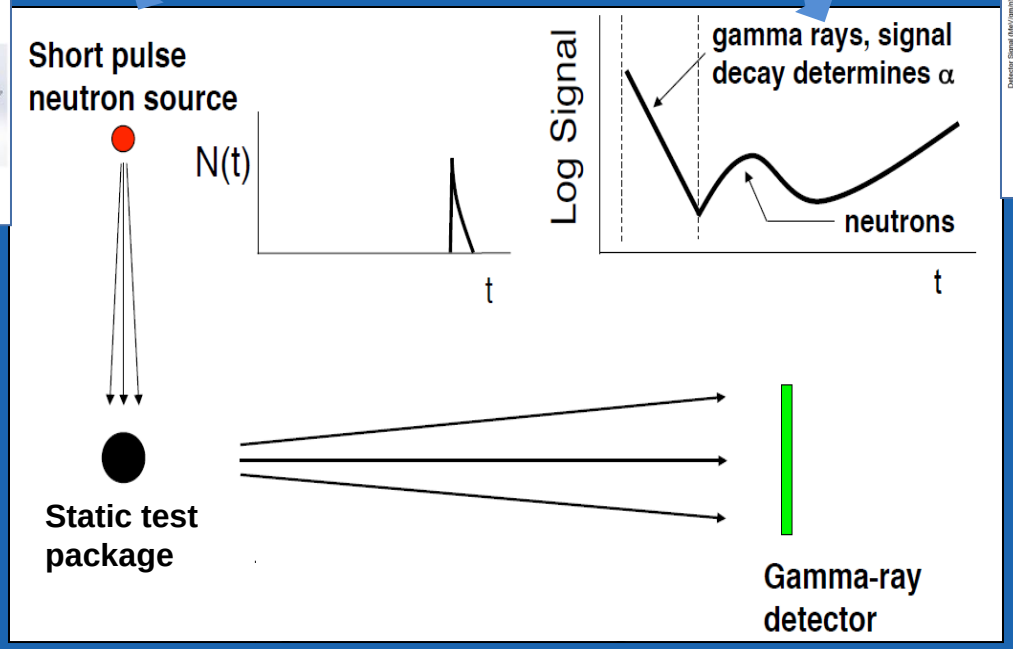
- New optical diagnostics provide unprecedented quality and quantity data to change experimental techniques that have been used for 70 years
- Data from the first experiments is already affecting this year's annual assessments

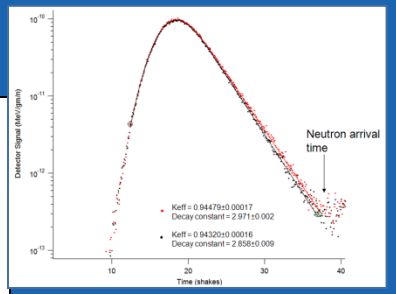


Multipoint "fisheye" optical probe designed and assembled by NSTec

Neutron Diagnosed Subcritical Experiments (NDSE) Induce Neutron Multiplication in a Dynamic System Using An External Neutron Source

Recent developments in neutron sources and detectors are essential





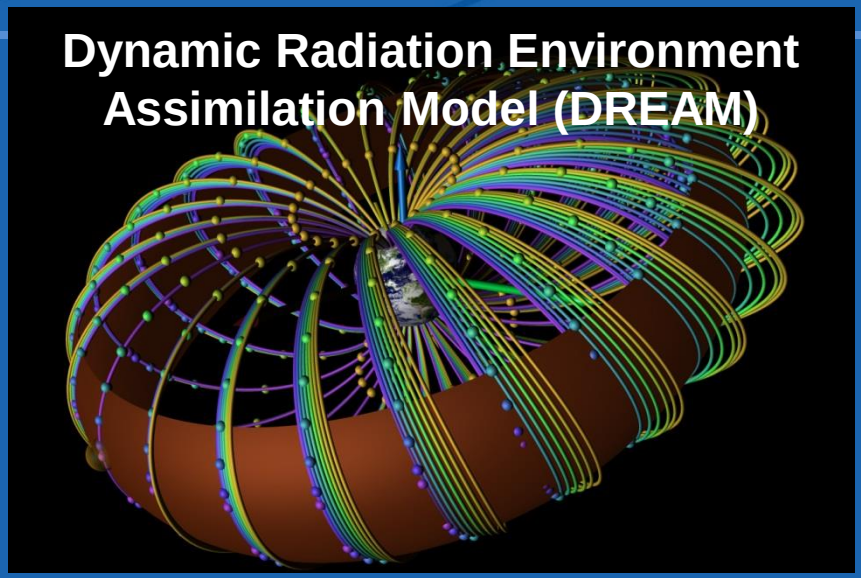
Uncertainties are small enough to test models

Provide a valuable opportunity for designers to *measure* the neutronic response of a test object - a unique, new capability in the complex

Reducing Nuclear Danger

MISSION DELIVERY

Dynamic Radiation Environment Assimilation Model (DREAM)



Modeling tool:

- simulates space environment
- predicts space weather
- understand Earth's radiation belt

National security applications - could calculate high altitude nuclear explosion data

Off-Site Recovery Program (OSRP)

Domestic Recoveries: 26,800 sources recovered / 825,000 curies

International Recoveries: 2,430 sources / 18 countries / 4,113 curies

Threat reduction activities coordinated with the Nuclear Regulatory Commission

National Security Emergency Response Builds on Weapons Program Capabilities

MISSION DELIVERY

Exercises can occur anywhere and participants may have only a few hours to prepare and respond

National Special Security Events(NSSEs) in 2013 like:

- State of the Union
- Presidential Inauguration
- Super Bowl in New Orleans

SCIENCE SUPPORTING MISSION

Goal: Foster Excellence in Science and Engineering Disciplines Essential for National Security Missions

- Strategies:
  - Sustain a culture of excellence to ensure the quality and integrity of our science and engineering solutions;
  - Strategically invest in breakthrough science and engineering;
  - Lead in transformational science at the extremes

LDRD is an essential source of investment in our four science pillars

Four Pillars Define Key Investments for the Laboratory

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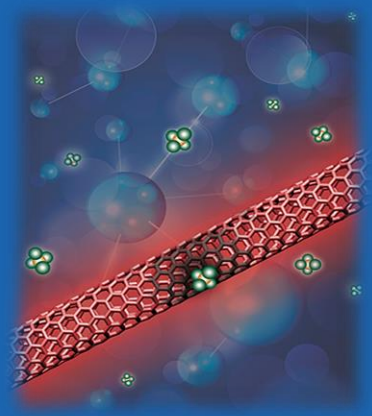
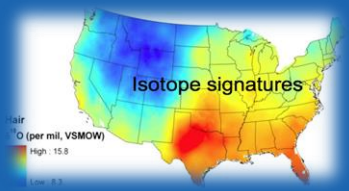
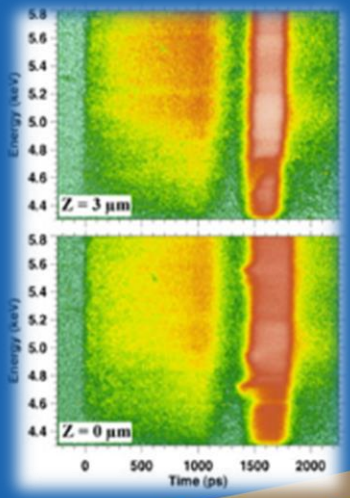
Experimental Materials science	Information science and technology	Science of signatures	Nuclear and particle futures
Focus is on the materials of the future	Enables integrative and predictive science	For nuclear, biological, and chemical threats	Nuclear phenomenology for weapons and broader national security missions







SCIENCE SUPPORTING MISSION

Experimental Science: Making, Measuring, and Modeling Metals

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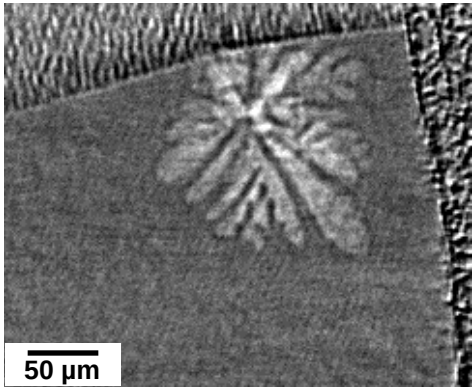
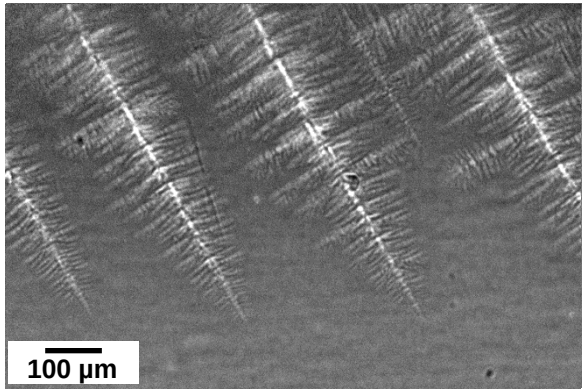
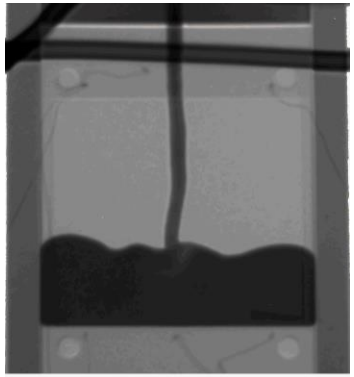
Micro- ***Meso-*** ***Macro-***

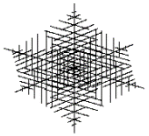
Experiments

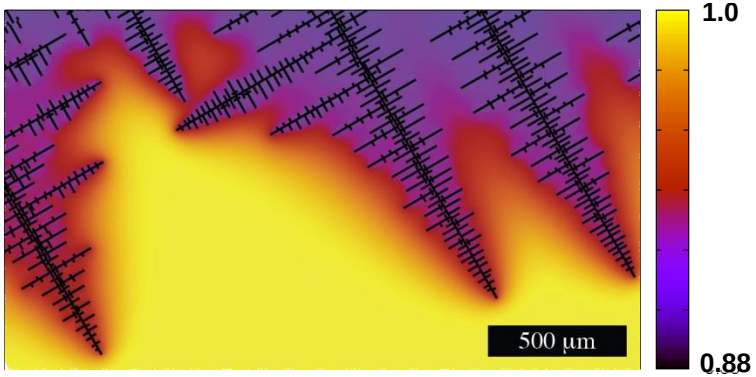


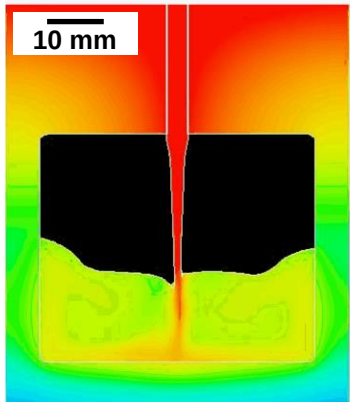




Simulations

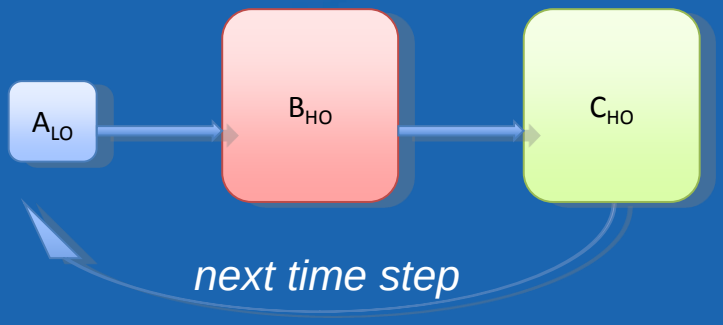






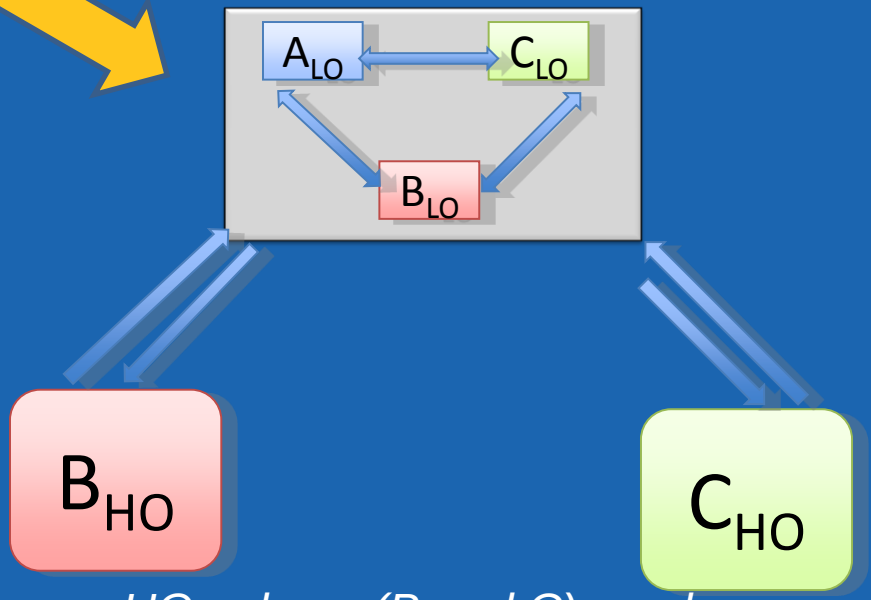
Advanced x-ray and pRad diagnostics coupled with microstructure-aware models advance solidification and manufacturing science and enable process-aware understanding of performance

Information Science and Technology: Multi-scale Algorithms Enable More Effective Use of Future Computer Architectures



- Multi-scale codes involve meso-scale physics models when the continuum model is not accurate enough
- Current research is combining low-order (LO) and high-order (HO) algorithms
- Factor of 40 reduction in CPU time realized with enhanced physics

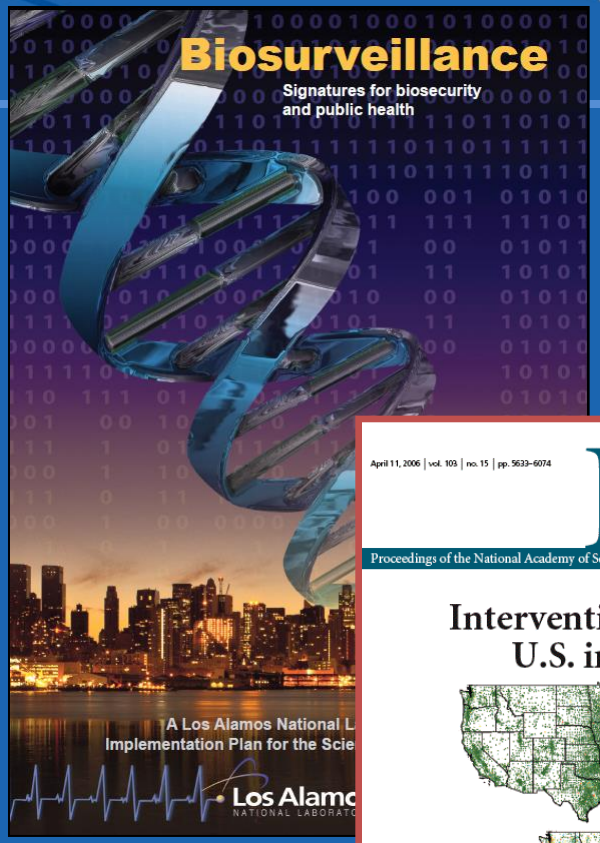
Nonlinear iteration within time step at LO level small # of nodes and small fraction of workload



HO solvers (B and C) can be executed concurrently (load balance) reduced global communication majority of nodes and FLOPs

Science of Signatures: Biosurveillance

- Targets early disease detection and intervention for public health and biological threats
- Integrates our capabilities in biological science and in IS&T
- Couples rapid sensing and characterization with predictive modeling to help shape targeted intervention



Nuclear and Particle Futures: LANL is *the* Premier Laboratory for All-Things Nuclear

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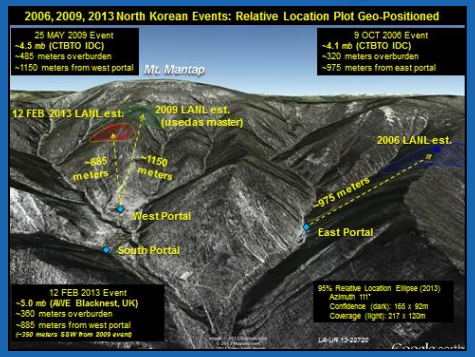
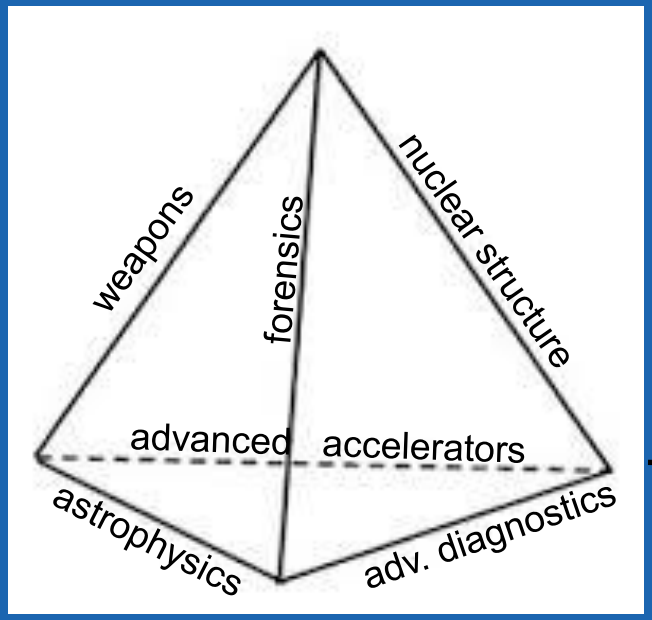


Applied Nuclear Science and Engineering



Nuclear, particle, astrophysics & cosmology

Weapons HEDP & fundamental research ← HEDP&F →

Accelerators & Electrodynamics (Enabling diagnostics and driver technologies)

Enduring strength in these capability areas contributes to multiple programs

OUR PEOPLE

Goal: Attracting, Inspiring and Developing World-class Talent to Ensure a Vital Future Workforce

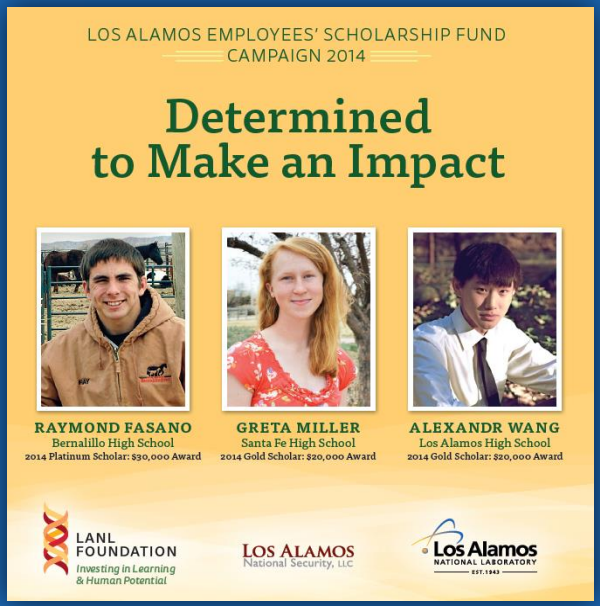
- Strategies:
  - Position the Laboratory to compete for and attract world-class talent;
  - Develop and mentor next-generation workforce and leadership talent;
  - Position the Laboratory as one of the best places to work

Identify and Develop Future Laboratory Leaders

- Director's Leadership Development Program (DLDP)
  - 41 participants
  - Project teams, supported by high-level external strategy coaches and LANL Executive Team, worked on pressing strategic issues for Lab, such as: National Security Lab in the 21st Century
  - Year-long program with coursework by UC-Haas Business School faculty
- DLDP to be formalized as an every-other year program

To Have the Strongest Future, We Must Be Representative of the Broadest Talent Pool

New partnerships with Historically Black Colleges and Universities (HBCU)



LANL Foundation Scholarship Students

OPERATIONAL EXCELLENCE

Goal: Enabling Mission Delivery Through Next-generation Facilities, Infrastructure, and Operational Excellence

- Strategies:
  - Demonstrate leadership in environmental stewardship, commitment to sustainability, and social responsibility;
  - Transform our infrastructure to enable scientific breakthroughs;
  - Drive productivity and innovation in all aspects of operations, business systems, and information systems; and
  - Protect our people, our assets, and our information

Enable productivity through enhanced facilities, operations and business experiences that seamlessly support our core work activities

New Office to Provide Sustained Focus for Operational Improvements

- PADOPs introducing Strategic Improvement Office to champion and execute projects to achieve our strategic vision:
  - Facilities and Infrastructure to enable mission today and tomorrow
    - Scientific equipment recapitalization, mobile computing strategy, facility capability investments, etc.
  - Supporting Lab goals to be a best place to work
    - Campus beautification, facility recapitalization, new worker experience, etc.
  - Enabling the Laboratory to work seamlessly
    - Optimizing radiological operations, chemical management, process improvements for travel, time & effort, etc.

Infrastructure Revitalization Supports Science and Mission

- **Creating New / Modern Lab Space**
  - Improving facility utilization
  - Created or improved 35,000SF of lab space last year
  - On track to complete another 25,000SF this year
- **Novel Approaches to Space**
  - Recapitalizing Building Systems
    - Revitalizing the facility portfolio
    - Replacing major equipment in 10 Facilities/year: HVAC Systems, Electrical Distribution, Fire Protection, Roofing, Plumbing, Structural
  - NM Consortium
    - Model - non-profit builds lab and our people are able to move in and do research

New Productivity Apps for Mobility Devices

- Pilot project: develop quality Mobile Applications for internal use to increase productivity; provide public apps in the areas of education and information
- Initial customer showcase held in January 2014
- All employee showcase scheduled for May 2014
- More to come. For details see - http://mobile.lanl.gov

July 2013	Sept 2013	Jan 2014	Feb 2014	March 2014	April 2014	May 2014	June 2014
70th Anniversary LANL App	Safety Cinema	Virgin Pulse TLD IT	MobileMatch	Project Y	View IT In Use Now Toss IT	Locate IT Utility Observe IT	Student App Concur

AIT Mobile Enterprise

Despite challenges, we are working to deliver on our commitments to the 3706 TRU Waste Campaign

OPERATIONAL EXCELLENCE

- Processing completed for drums and boxes
- At the time of the WIPP shutdown, 120 LANL WIPP shipments remained
- Worked with WIPP to develop storage options
- Shipments began April 1 to Waste Control Specialists in Andrews, TX for temporary storage
  - As of April 8 - 10 shipments have been made successfully
  - About 10 shipments/week will continue until completion
- As of March 30 - 3,176 cubic meters have been shipped

I am Acting on Recommendations From LANL Team Retreat in February

OPERATIONAL EXCELLENCE

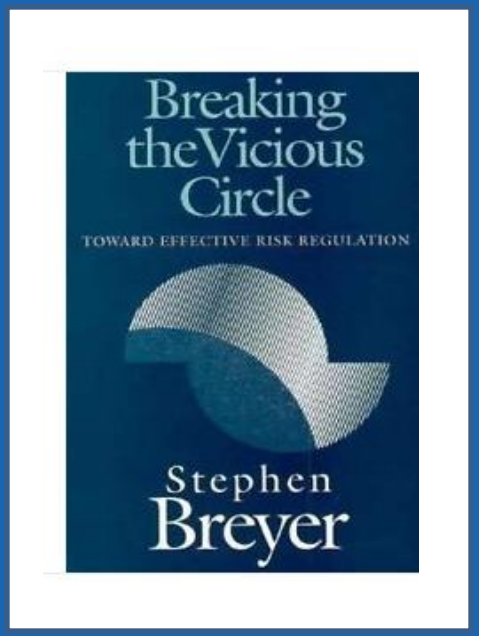
- Need to reverse trend line of growing management structure
  - Upon approval from DOE, we will announce changes to the number of ADs
  - Expectation set among leadership team that many management vacancies will not be filled
  - Considering additional compression of management levels
- Emphasis on increasing revenue to reverse trend showing that we are losing market share to other Labs
  - Strategic relationships with DOE, NNSA, partners are more important than ever
- Cost-cutting initiatives needed to create headroom, so that we can continue to make strategic S&T investments

SHAPING OUR FUTURE

Laboratory Director's Role: Advocate/Spokesperson

- National Laboratory Policy Council (LPC) is tackling many issues, including things like LDRD funding
- Testimony in front of Senate Armed Services Committee
  - We are being asked to do more with less
  - We need priority decisions and direction – timely, predictable funding
- Members send thanks to our Laboratory
  - Senator Angus King – "please recognize your people…. They provide an umbrella for the world"
  - Senator Mark Udall – "intellectual capital" of the people at our national Labs "is part of our overall deterrent"

Challenging Assumptions in Our Governance and Risk Management



- "Breaking the Vicious Circle: Toward Effective Risk Regulation" presents interesting insights and ideas
- Breyer proposes the formation of a group of highly skilled civil servants – insulated from politics – to examine risk/regulations
  - Perhaps this idea has a place in our world?
  - Panel made up of highly-qualified experts from DoD and the DOE whose first job is to balance risk and program

Laboratory Director's Role: Collaborator and Communicator

- DOE and NNSA Leadership
- Board of Governor's (BOG) Meetings
- Office of Science, DOE, and NNSA Laboratory Interactions
- University of California Regents
- University of California President – Janet Napolitano – (upcoming visit)
- LANS BOG Chairman – Norm Pattiz – (upcoming visit)
- VP of Laboratory Management – Glenn Mara Replacement

We all are ambassadors for the Laboratory

In This Time of Uncertainty and Change, the Laboratory Direction is Stable

- National Academy of Sciences
- Congressional Committee – Governance
- Ongoing Improvement Efforts
- Changes in Leadership

In spite of these constant adjustments, the ideas we have laid out in the strategy will endure into the future:

1. **deliver on commitments**
2. **make this one of the best places in the world to work**
3. **be a Laboratory that works seamlessly**