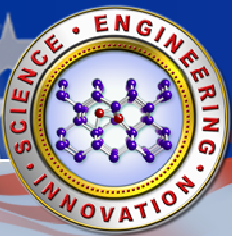




**Laboratory Directed  
Research and  
Development (LDRD) Day  
Symposium and Awards  
for Excellence  
September 9, 2008**

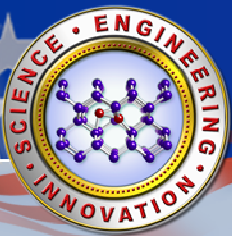
**Hank Westrich  
LDRD Program Manager**





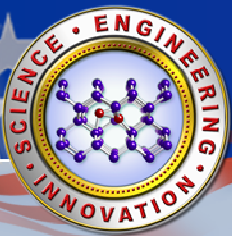
# Logistics and Acknowledgements

- **Emergency exits and biofacilities**
- **Thanks to:**
  - **LDRD office personnel**
  - **External attendees**
  - **Sandia staff**
  - **Wendy Cieslak**



# Third Annual LDRD Day

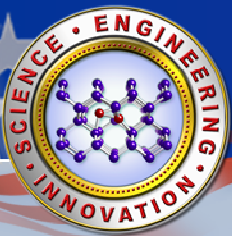
- **Symposium devoted to communication & recognition**
- **Leading edge R&D in support of national security missions**
- **Great opportunity for you to**
  - Listen to exciting, leading edge R&D
  - Seek networking opportunities for future work
  - Chance to leverage R&D outcomes
- **If you have IP, be careful what you communicate**
  - Disclosure of written/verbal information creates patent bar date and 1 year deadline for filing US Patent Application (not applicable for foreign patents).



# LDRD Day Agenda

**MC and Host: Wendy Cieslak**

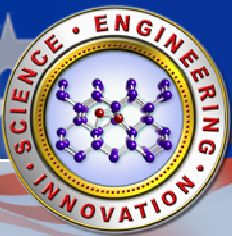
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# Laboratory Directed Research and Development (LDRD) Day Symposium and Awards for Excellence

September 9, 2008

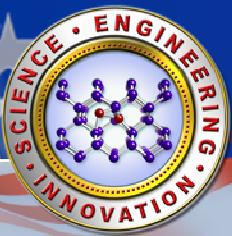
**Rick Stulen**  
*CTO and VP of ST&E SMU*



# LDRD Day is an opportunity to showcase outstanding LDRD accomplishments

- **LDRD is Sandia's discretionary R&D funding**
  - Nurtures the core
  - Supports the missions
  - Drives the future
- **Staff participation is key to success**
  - Leading edge R&D
  - National security relevance
  - Internal/external collaborations
  - Program application/Technology transfer





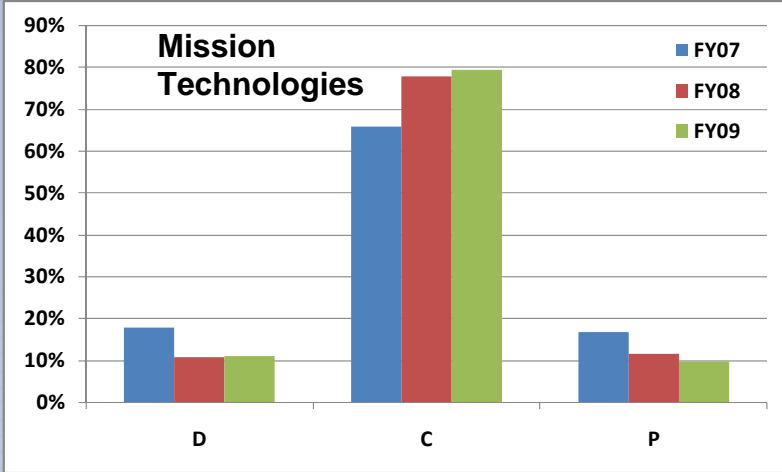
# LDRD program improvements are continuing

- **Strategy**
  - Senior Steering Committee discussion of Investment Area (IA) goals and R&D needs prior to call for ideas
- **Process**
  - Oral review of proposals provide greater transparency
  - CTO review of portfolio to assess strategic alignment & quality
  - Regular financial reporting and increased project oversight
- **Outcome**
  - Completed project reviews to identify next steps in leveraging R&D

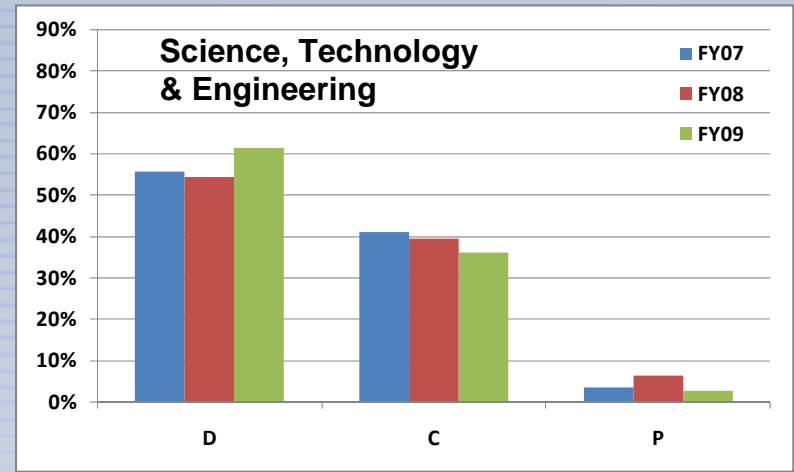


# Progress Report: Strategic intent of new projects and process efficiency have stabilized

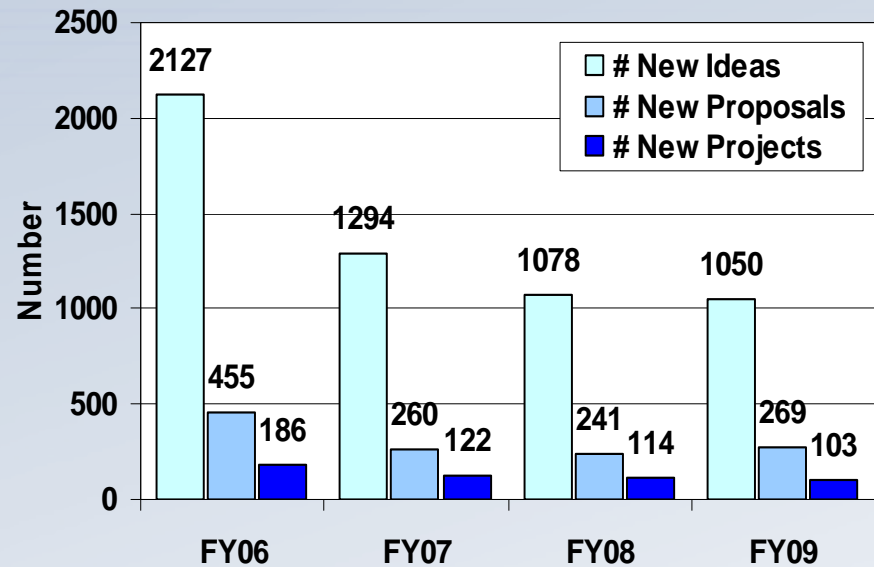
% of Program Area Projects



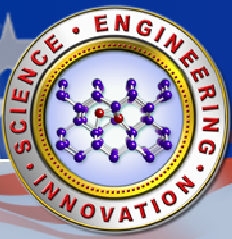
% of Program Area Projects



LDRD selection process is highly competitive, where ratio of ideas to new funded projects is ~10:1







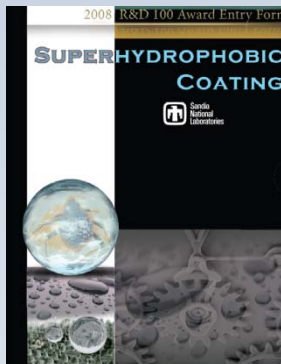
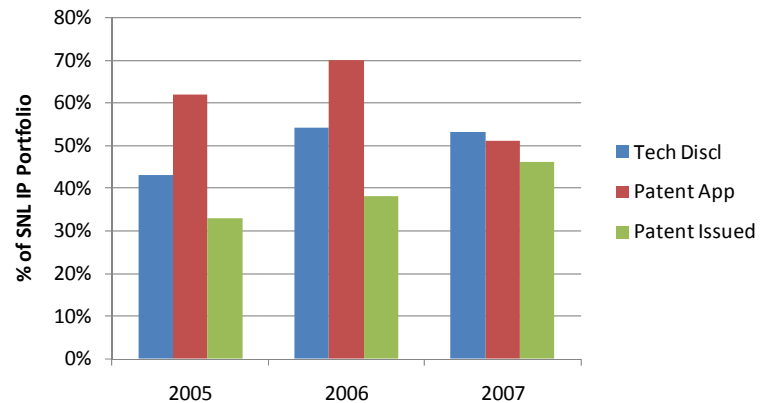
# Progress Report: LDRD focuses on external impact and innovation

## LDRD is often the first step for technology transfer at SNL

### Intellectual Property

A disproportionate amount of Sandia's IP originated in LDRD

LDRD is the primary innovation engine at SNL



### Technical Innovation

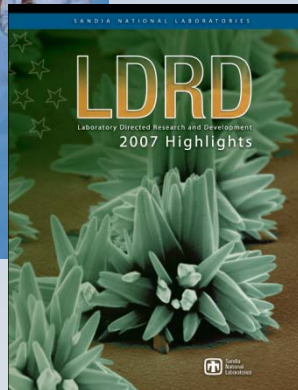
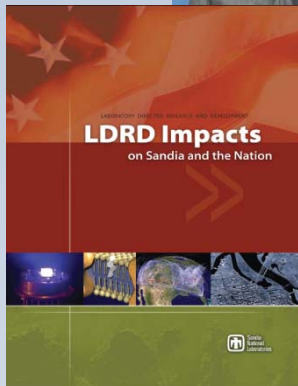
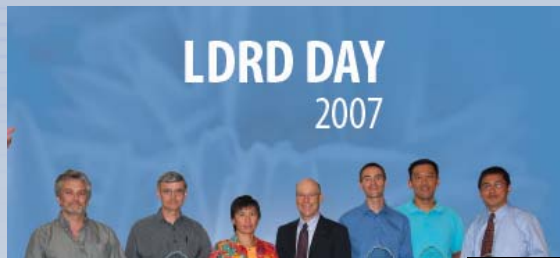
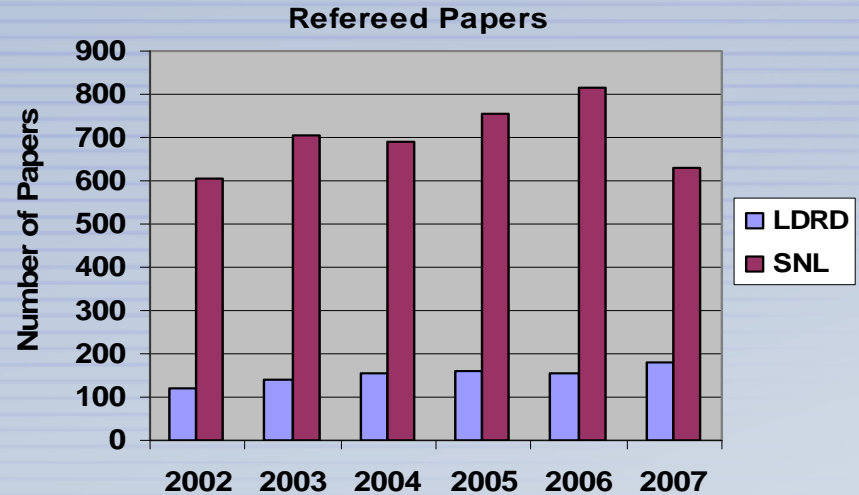
All of SNL's R&D 100 awards in 2008 were supported by LDRD



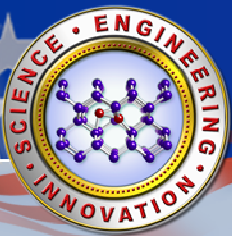


# Progress Report: Communication of accomplishments is key to LDRD impact

**S&T Leadership**  
LDRD publications enhance Sandia's S&T reputation

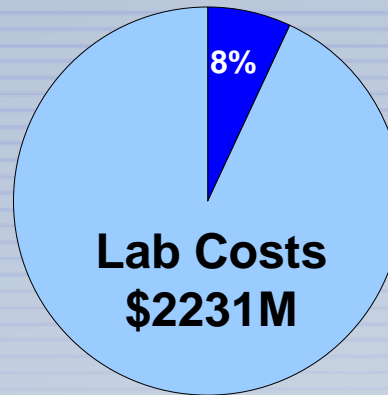


**Communication & Recognition**  
LDRD Day, awards & brochures highlight PI accomplishments



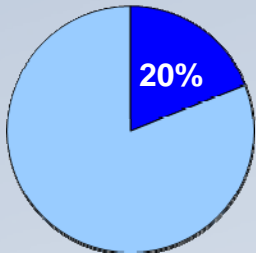
# LDRD Program impact far exceeds its 8% assessment

## FY2008 SNL LDRD Program

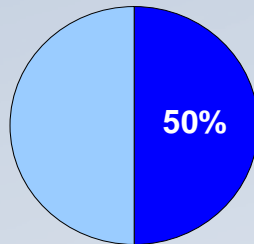


### 8% Assessment

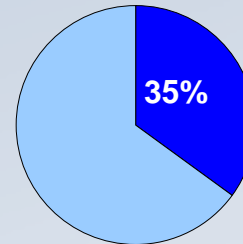
\$151M - 421 projects



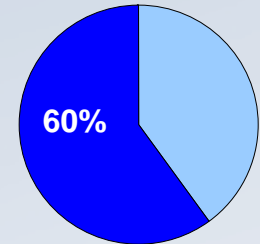
Labs' Peer-Reviewed Publications (2004-2007)



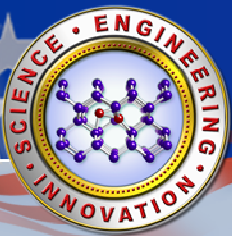
Labs' Postdocs Supported (2004-2008)



Labs' Patents Issued (2003-2007)

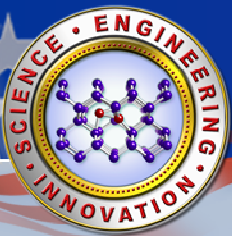


Labs' R&D 100 Awards (2004-2008)



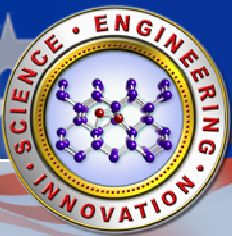
# LDRD provides great opportunities

- Nation faces serious security challenges
- LDRD could provide innovative solutions



**End of Introduction**

**Begin Individual Talks**

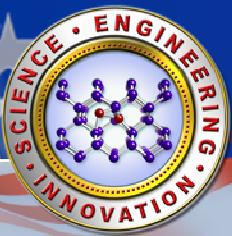


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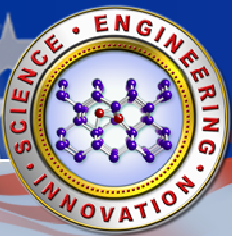




# LDRD Awards for Excellence

**Rick Stulen**

**CTO and VP ST&E SMU**

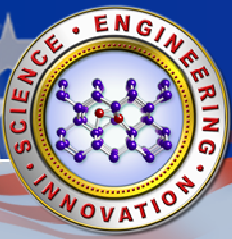


# LDRD Award for Excellence

**These Awards recognize excellence in R&D and bring much-deserved recognition to our best researchers. A nomination for the LDRD Award is an acknowledgment of the outstanding nature of their R&D.**

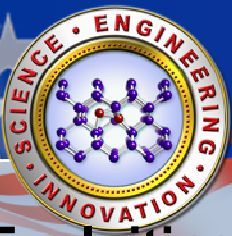
**To be eligible, an LDRD project must have finished in one of the last three fiscal years (FY2006-FY2008). Nominations are submitted by Investment Area leads, and they are evaluated by Rick for their embodiment of “National Laboratory Challenge, Risk and Creativity,” and of “National Laboratory Relevance and Impact.”**

**Congratulations to all!**



# 2008 LDRD Award for Excellence - Winners

- **A MEMS based Thermoacoustic Engine PI: Chris Apblett**  
Developed a fundamentally new microscale engine based on thermoacoustics, and demonstrated critical fabrication steps to realize a 1 cc prototype heat engine with no moving parts.
- **Creating a Discovery Platform for Confined-space Chemistry and Materials: Metal Organic Frameworks PI: Mark Allendorf**  
*This LDRD created, for the first time, metal organic framework films on surfaces, providing a foundation for development of new MOF-based devices and surface chemistries.*
- **Collaborative Situational Awareness in Network-Centric Warfare PI: John Ganter**  
*Developed a new systems analysis technique to explain the role of crew communication and linguistic reasoning in cross-cultural Intelligence, Surveillance and Reconnaissance (ISR) sensor operations.*



# 2008 LDRD Award for Excellence - Winners

- **Exploiting Interfacial Water Properties for Desalination and Purification Applications** PI: Randy Cygan

*A multifaceted fundamental research program to develop the basic understanding of structure, transport, and chemistry of water near surfaces and in confined spaces.*

- **Ion Neutron SIMulation – INSIM** PI: George Vizkelethy

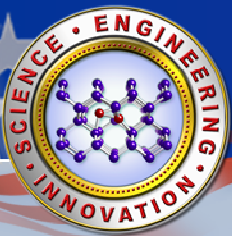
*A method was created using high-energy heavy-ion beams to simulate neutron displacement damage in electronic devices.*

- **Miniature Flow Cytometer for Medical Diagnosis and Pathogen Detection** PI: Igal Brener

Demonstrated flow focusing of cells and beads using acoustic waves in a microfluidic chip, a critical technology for miniaturization of flow cytometry.

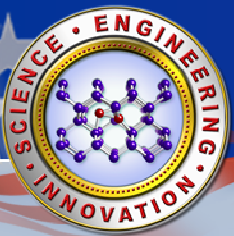
- **Molten Salt-Based Growth of Bulk GaN and InN for Substrates**  
PI: Karen Waldrip

*Development of novel, scalable crystal growth technique for incongruently melting materials with volatile components, e.g., group III-nitrides.*



# LDRD Award for Excellence - Honorable Mentions

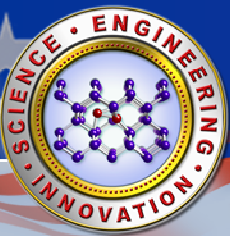
- **A Modern Nuclear Weapon Communications Architecture (Gerald Boyd)**
- **A Novel Method to Construct Software (Sam Miller)**
- **Atomic Shadow Microscopy (Steve Foiles)**
- **Characterizing the Emissivity of Materials Under Dynamic Compression (Daniel Dolan)**
- **Developing Key Capabilities for Quantum Computing: Trapped Ion and GaAs Approaches (Matt Blain)**
- **Development of Advanced UV Light Emitters and Biological Agent Detection Strategies (Mary Crawford)**
- **Enabling Immersive Simulation for Complex Systems Analysis and Training (Matthew Glickman)**
- **Parallel Computing in Enterprise Modeling (Robert Armstrong)**
- **Ultra-Fast Low-Voltage MEMS Switches for Optics and RF Applications (Greg Nielson)**
- **“Trojan Horse” Strategy for Deconstruction of Biomass for Biofuels Production (Masood Hadi)**



**Thank You!**







# Logistics

- Posters and pizza are in a tent due South of 858EL
- Poster PIs should go to front of food line
- Provide feedback via email to LDRD office [ldrd@sandia.gov](mailto:ldrd@sandia.gov)
- Enjoy the posters!

