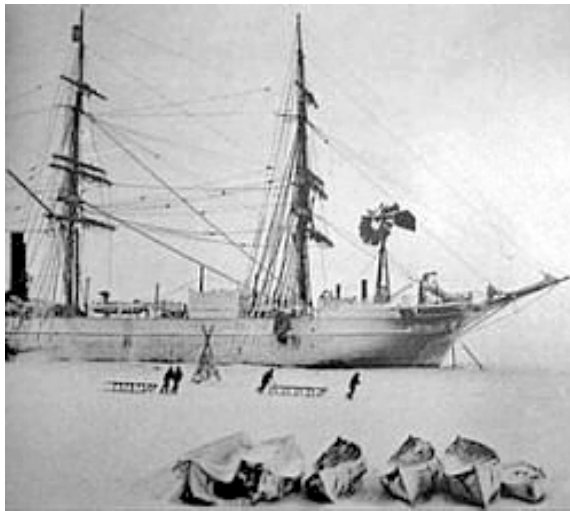


Optimization and Uncertainty Estimation 1411 Department Review 2006

**“Men wanted for hazardous journey.
Small wages, bitter cold, long months of complete darkness,
constant danger, safe return doubtful.
Honour and recognition in case of success.”**



**Advertisement for Antarctic
trip by Sir Ernest Shackleton
(apocryphal)**

Scott A. Mitchell

www.cs.sandia.gov/optimization/

SAND2006-3639P

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Outline

- **Strategy**
- **Trends**
- **Staffing & Budget**





Current strategy and issues

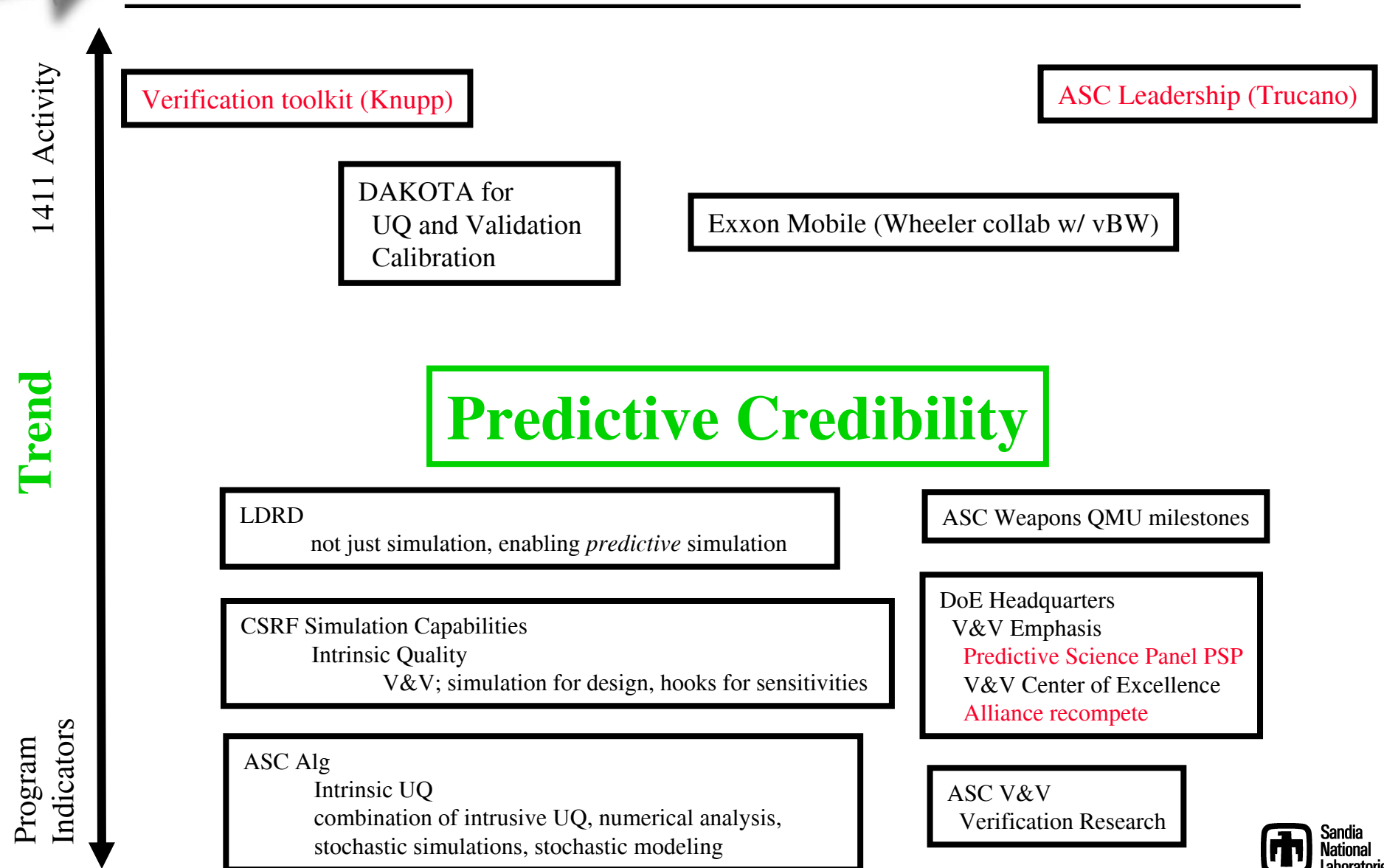
- Current strategy, articulated last year, demonstrated this year
 - Broaden to engage with emerging areas.
Enabling ubiquitous optimization/UQ and M&S.
 - Changing Applications
 - Other than NW hardware assessment ↑
 - Demonstrating value of MS&O in microsystems ↑
 - Partner across 14x0, 1500, 1700, 2600, 8900
 - Broad University, industry, tri-lab engagement
 - Technologies
 - Derivatives (Sacado FAD / RAD) for complex SNL C++ PDE
 - Trilinos enabler for semi-intrusive opt
 - DAKOTA as end-use tool
 - Multi-fidelity (reduced order modeling)
 - Multi-scale & multi-physics (decontamination of biofilms)
- Work to ensure people not spread too thin



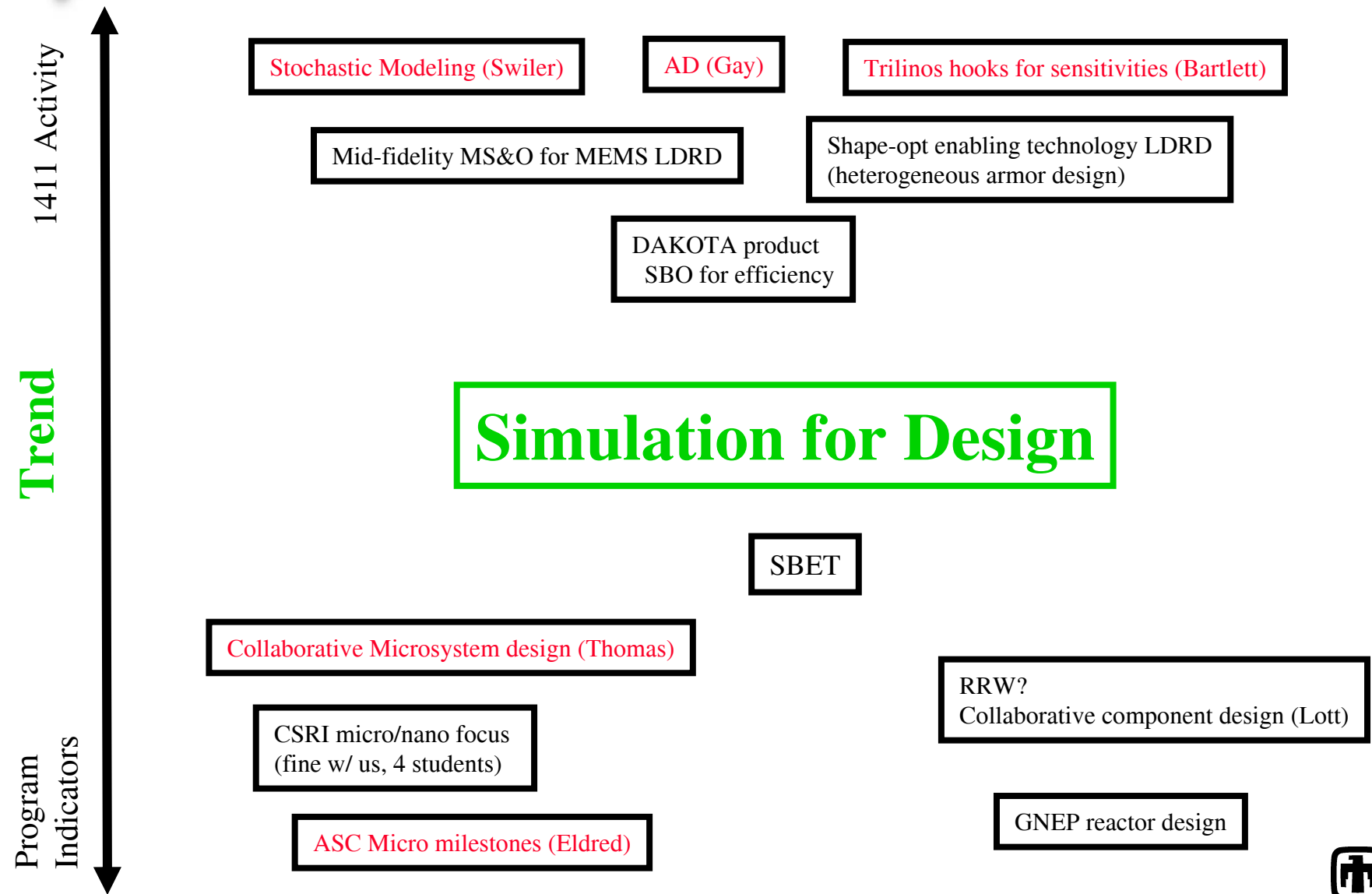
Program Trends

- Labs changing → three trends highlighted
- 1411 expertise central to defining many emerging National, ASC, Lab, Center themes
 - We're enabling technology so fairly easy to latch onto new "application" areas
 - **Red in following slides = will be discussed in staff talks**

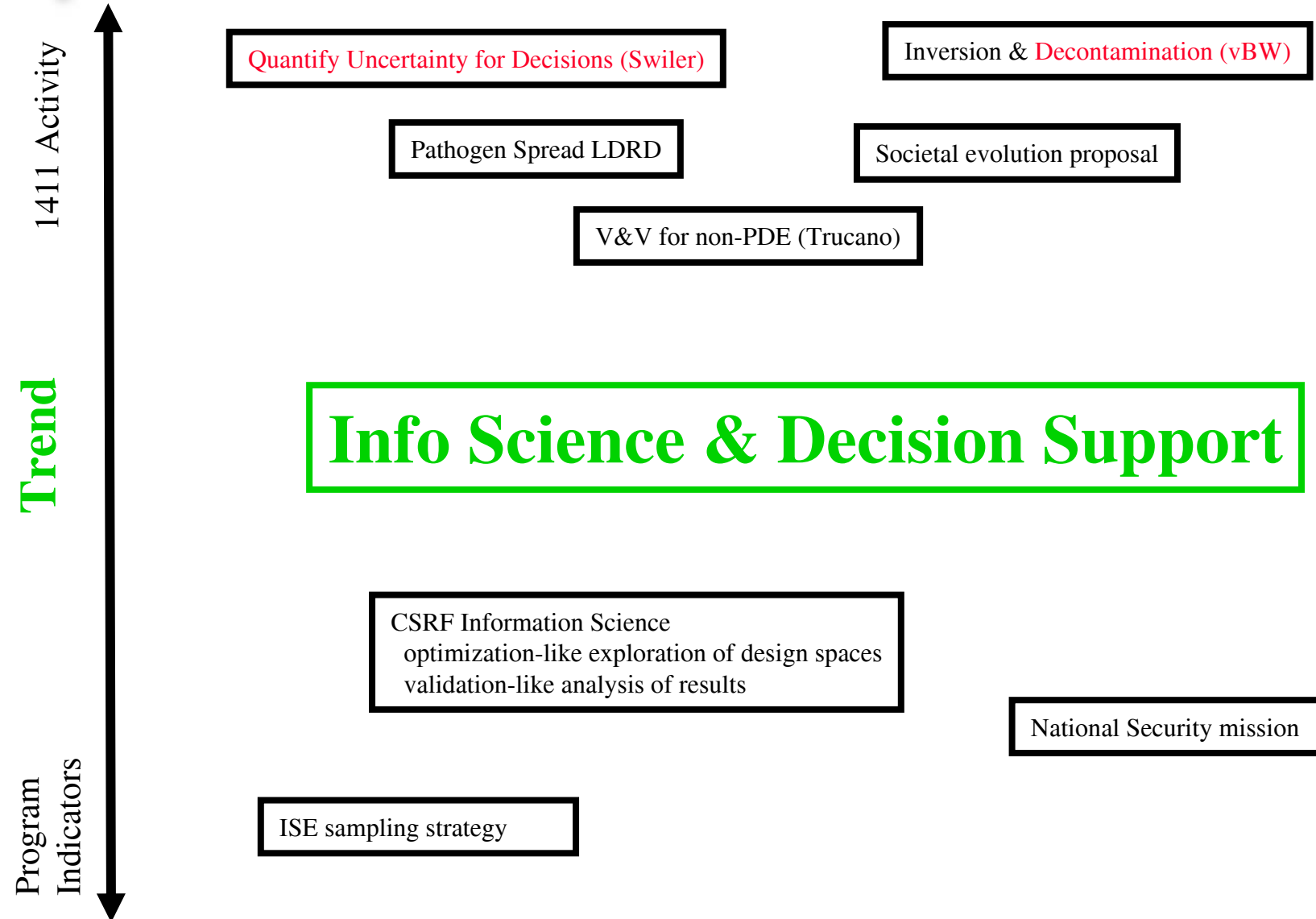
Program Trends



Program Trends



Program Trends



Looking outside



- WFO changing
 - EPA, LM-SV future, GY
- Series of “line-of-sight” workshops
 - SNL-NW, SNL microelectronics & microsystems
 - Not about throwing better tools over the wall; (potential) SNL missions want committed partners
 - Partnerships take time
 - SNL “impact” in tension with “research”
 - DoE / SC

Staffing

- FY06, green = joined, red = will leave
 - Brian Adams (LTE)
 - Roscoe Bartlett
 - Shane Brown (LTE)
 - Andrei Draganescu (LTE, to UMBC faculty)
 - Danny Dunlavy (LTE, von Neumann Fellow)
 - Mike Eldred
 - David Gay
 - Judy Hill (LTE, CSGF Howes Award)
 - Pat Knupp
 - Laura Swiler
 - Steve Thomas
 - Tim Trucano
 - Bart van Bloemen Waanders
- See [http://www.cs.sandia.gov/optimization/Department Review 2006, LTE talk slides](http://www.cs.sandia.gov/optimization/Department%20Review%202006,LTE%20talk%20slides)
- FY07
 - No change anticipated





FY06 Budget

- **DOE ASC slight downturn**
- **DOE Office of Science increase**
 - would like further SC growth, e.g. SciDAC-2

Take-home messages

- Broad engagement
- Trends we are positioned for
 - **Predictive Credibility**
aka simulation intrinsic quality / UQ / confidence / sensitivities
 - **Simulation for design** (vs. just assessment)
 - Stockpile & national security **decision support**
- Changing NW focus to application partnership vs. customer
- Many lab trends unclear, but we're relatively flexible, and can help define the future.



“Autumn Sunset” painted
by Sir Ernest Shackleton