

# NIST: Promoting U.S. Innovation and Industrial Competitiveness

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**NIST**  
National Institute of  
Standards and Technology  
U.S. Department of Commerce



## In the Minds of the Founding Fathers

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“Uniformity in the currency, weights, and measures of the United States is an object of great importance, and will, I am persuaded, be duly attended to.”

*George Washington, State of the Union Address, 1790*



*... The Congress shall have Power To ...*

*... and fix the Standard of Weights and Measures;*

*From the U. S. Constitution*

## Early NIST: Founded 1901

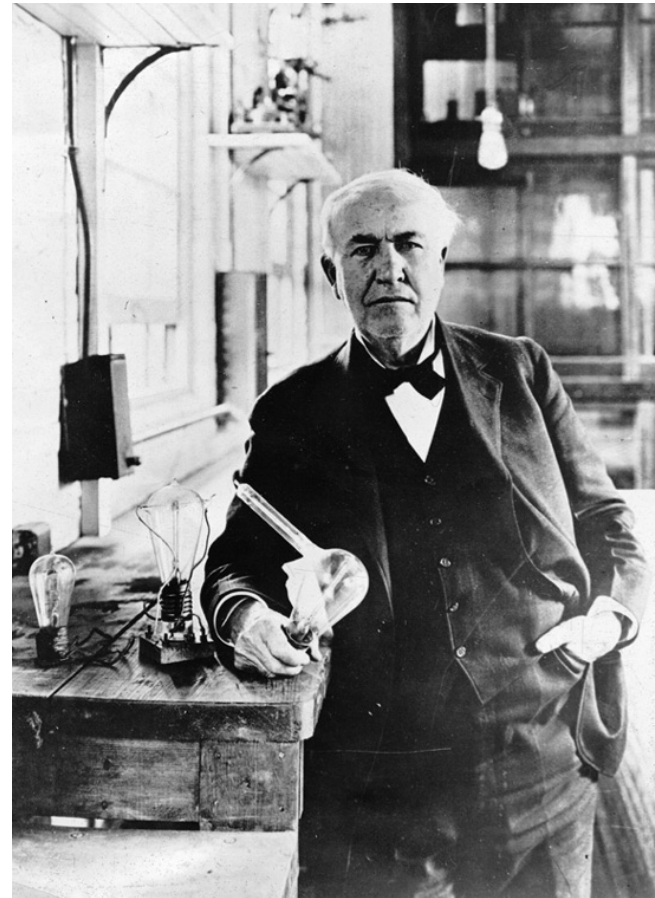
Established by Congress in 1901

Eight different “authoritative” values for the gallon

Nascent electrical industry needed standards

American instruments sent abroad for calibration

Consumer products and construction materials uneven in quality and unreliable



National Archives

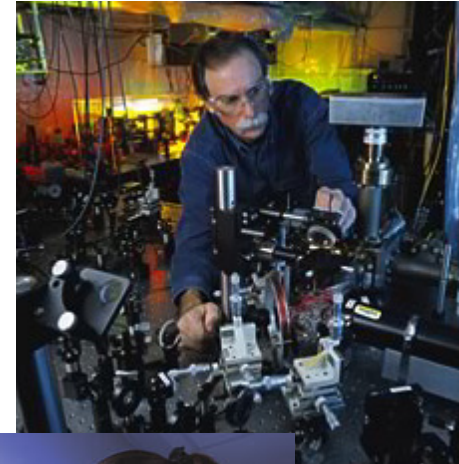
# NIST At A Glance

## Major Assets

- ~ 2,900 employees
- ~ 2600 associates and facilities users
- ~ 1,600 field staff in partner organizations
- ~ 400 NIST staff serving on 1,000 national and international standards committees

## Major Programs

- NIST Laboratories
- Baldrige National Quality Program
- Manufacturing Extension Partnership
- Technology Innovation Program



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# NIST has...

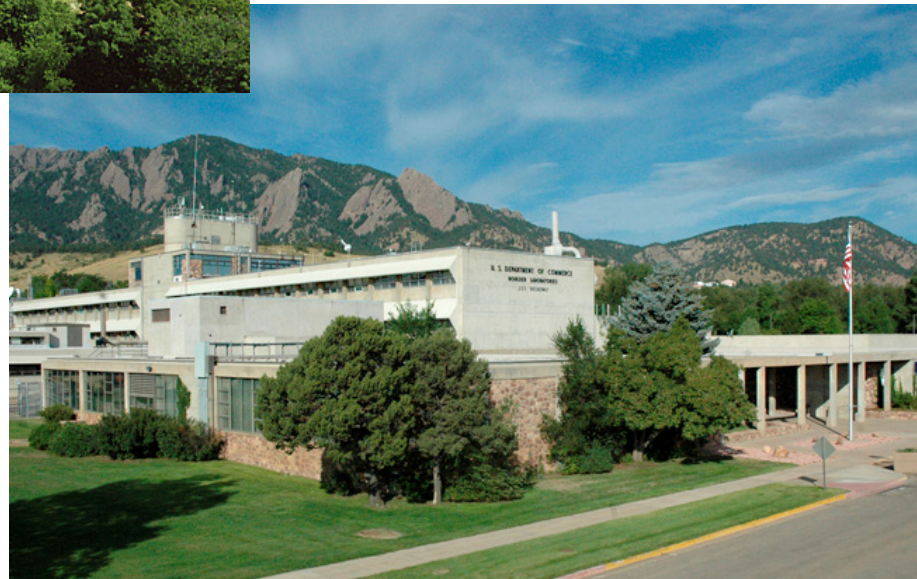
# ... two main campuses

## Gaithersburg, MD



Courtesy HDR Architecture, Inc./Steve Hall ©Hedrich Blessing

## Boulder, CO



©Geoffrey Wheeler

**NIST has...**

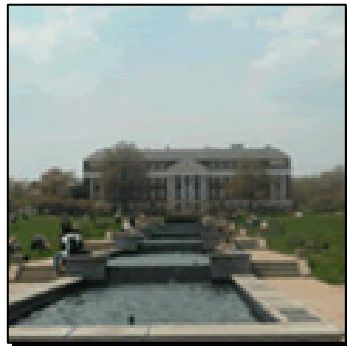
**...four joint institutes**



**JILA**

**NIST + University of Colorado**

**University of Maryland  
Biotechnology Institute**



**Joint Quantum Institute**

**NIST + University of Maryland + NSA**

**Hollings Marine Laboratory**  
**NIST + NOAA + South Carolina**  
**+ College of Charleston**  
**+ Medical University of South Carolina**





# NIST has...

# ... unique facilities

Advanced Measurement Laboratory



Courtesy HDR Architecture, Inc./Steve Hall ©Hedrich Blessing

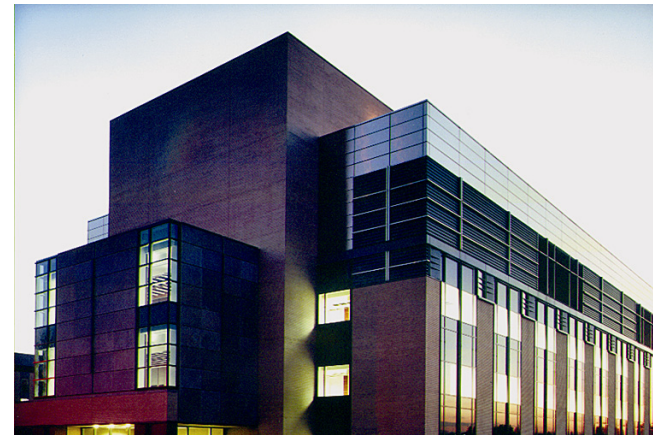
Center for Nanoscale Science  
& Technology



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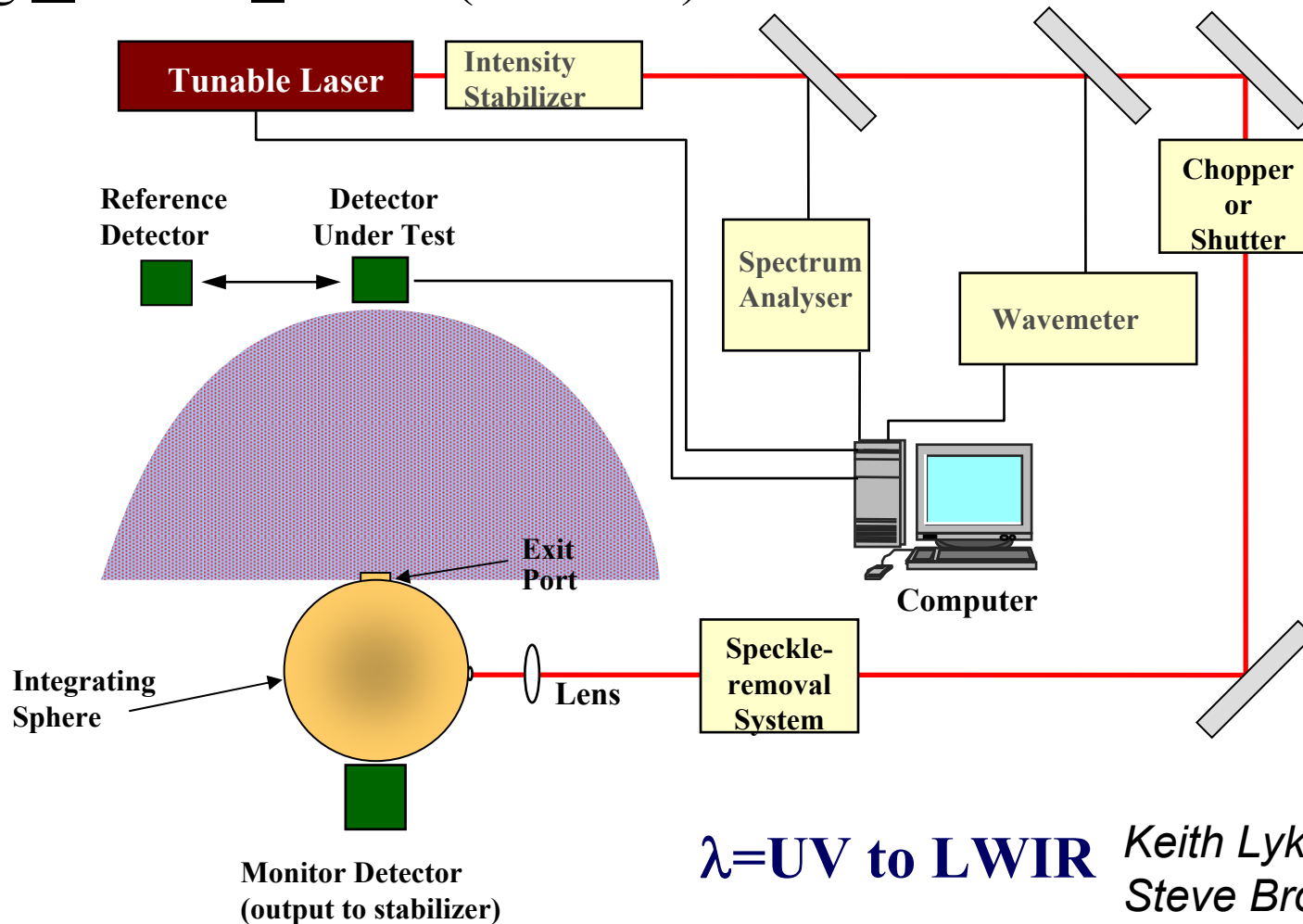
NIST Center for Neutron Research



Advanced Chemical Sciences  
Laboratory

# ...Including SIRCUS & Traveling SIRCUS

Spectral Irradiance and Radiance Responsivity Calibrations  
using Uniform Sources (SIRCUS)

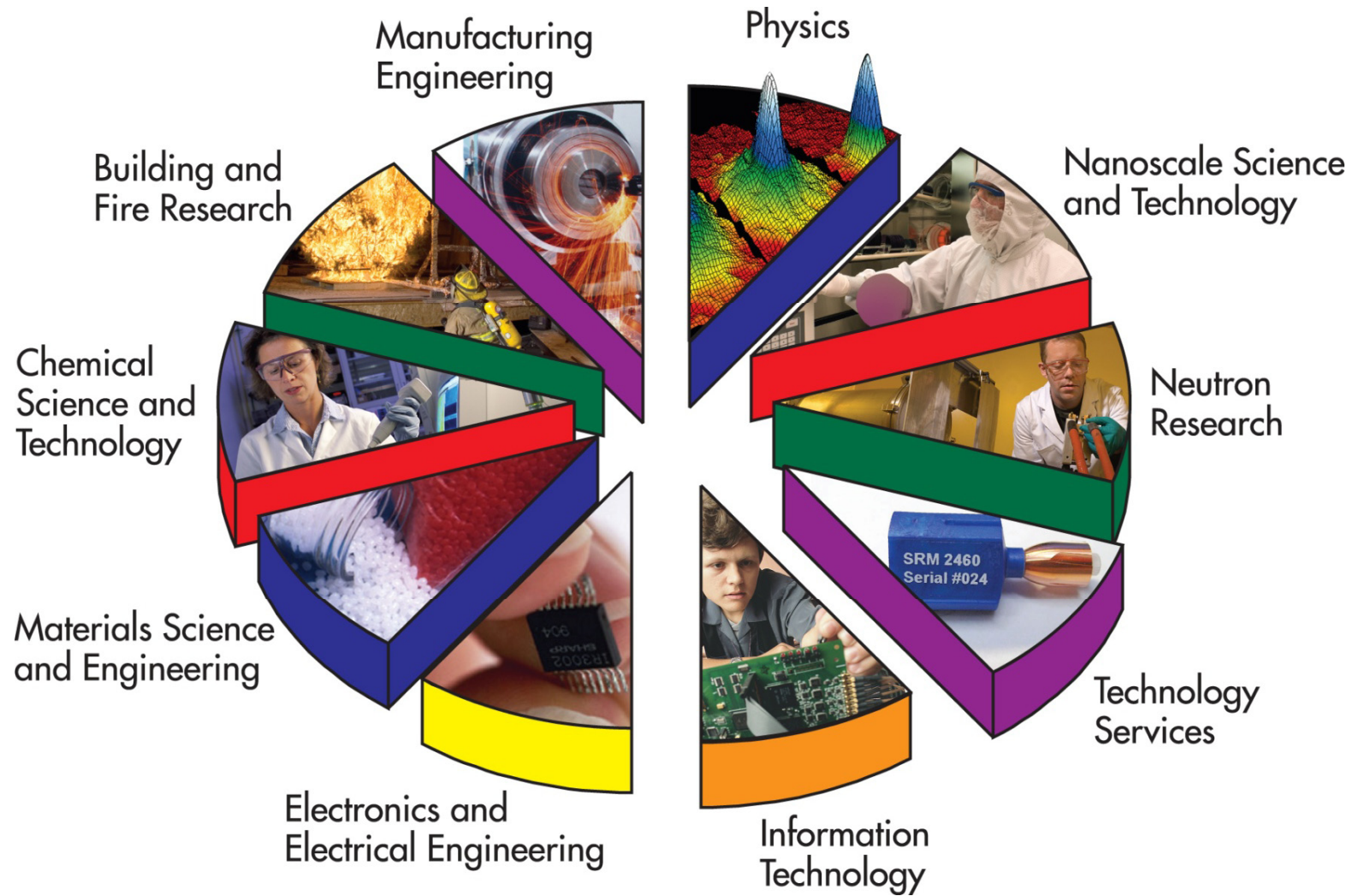


$\lambda$ =UV to LWIR

Keith Lykke  
Steve Brown  
George Eppeldauer



# The NIST Laboratories



# Metrology Meets Meteorology



**World Meteorological  
Organization (WMO)**



**International Committee for  
Weights and Measures (CIPM)**

*“...have agreed to work together to ensure that data related in particular to measurements of state and composition of atmosphere and water resources, coming from the programmes organized under the auspices of the WMO, are properly based on units traceable to the SI through the procedures of the CIPM MRA and the Technical Regulations of the WMO.”*

# WMO-BIPM Workshop

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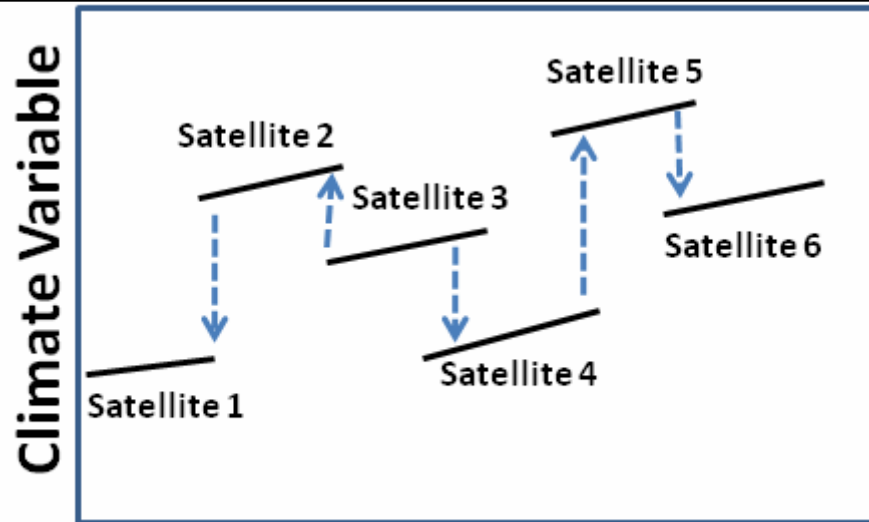
## **WMO-BIPM workshop on Measurement Challenges for Global Observation Systems for Climate Change Monitoring: Traceability, Stability and Uncertainty**

**Geneva, Switzerland**

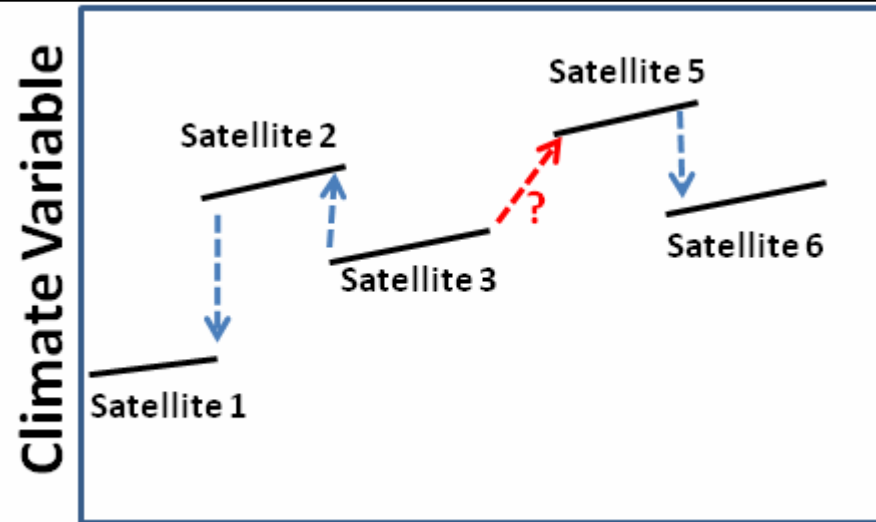
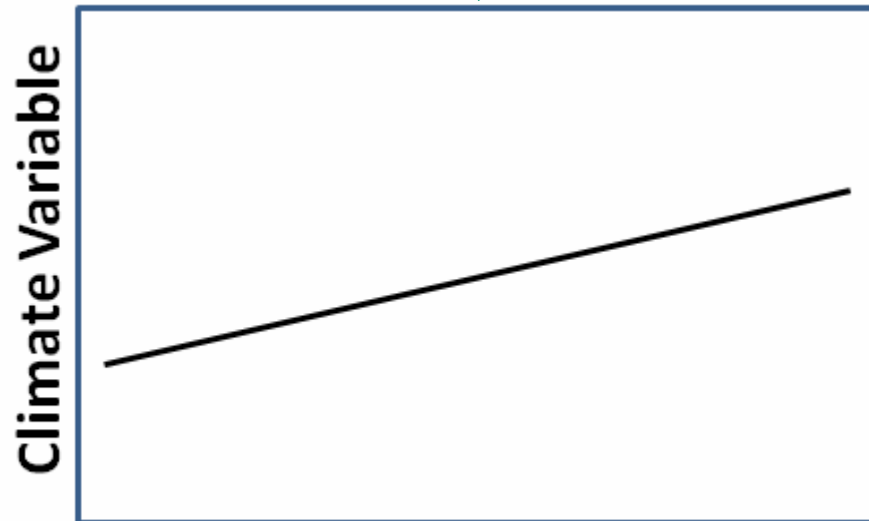
**30 March - 1 April, 2010**

*Pedro Espina*

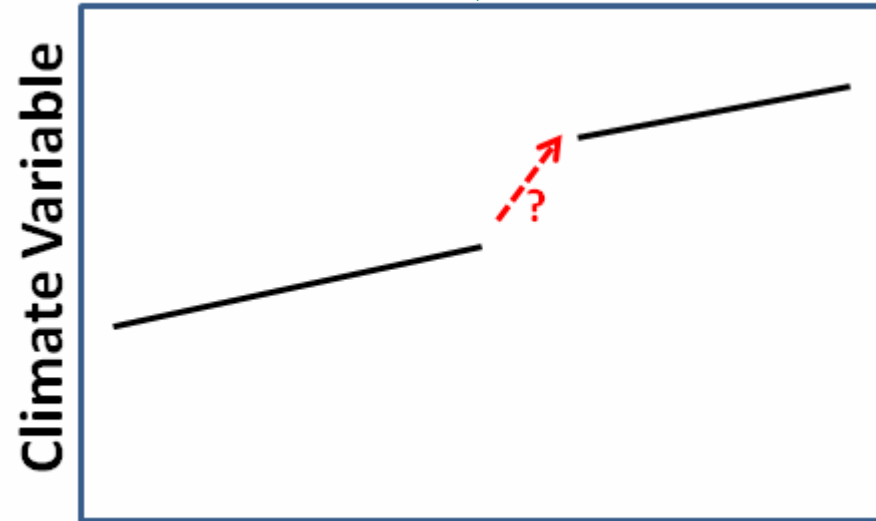
# Environmental Data Record Continuity at Risk



Time



Time





# Fact: Satellites Experience Launch Delays & Fail



Andreas Templin – Germany. See <http://www.riverart.net/paradise/competition/main.htm>

**→ *Workshop on Bridging Satellite Climate Data Gaps***  
**December 10, 2009**

*Raju Datla*

# Implementing the Recommendations of the ASIC3 Report

1. Conduct a set of satellite benchmark missions to create irrefutable records and calibrate other satellite sensors
2. Establish a U.S. National Center for Calibration (NCC)

