

If Measurement is the Answer, What is the Question?

Subra Suresh

Director
National Science Foundation



Measuring the Impacts of Federal Investments in Research
National Academies of Sciences, April 19, 2011, Washington, DC

National R&D Expenditures and Share of World Total, by Region: 2007

(Billions of U.S. PPP Dollars)

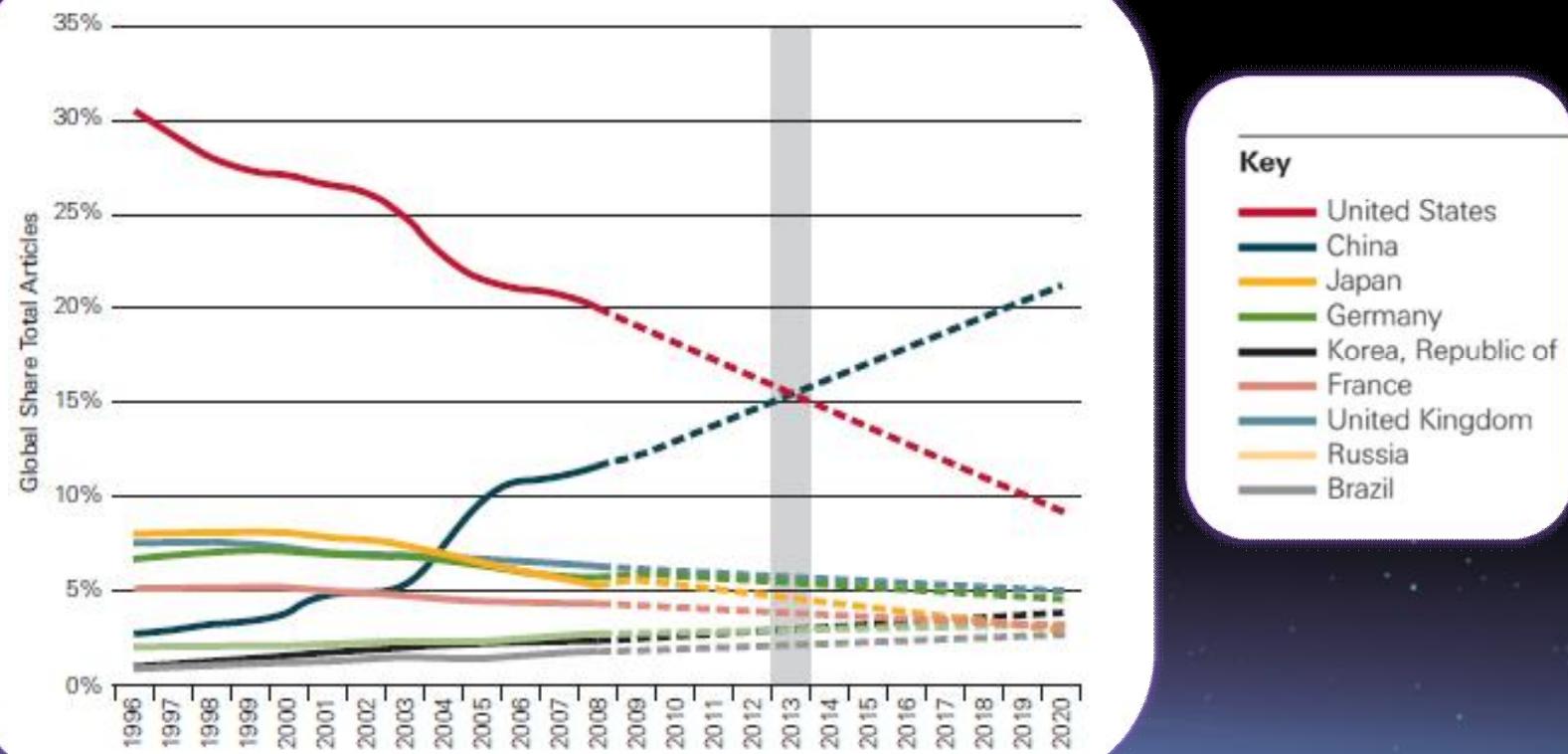




The Future?

Linear Extrapolation of Future Publication Trends Global Share of Total Articles

The dotted lines indicate projections



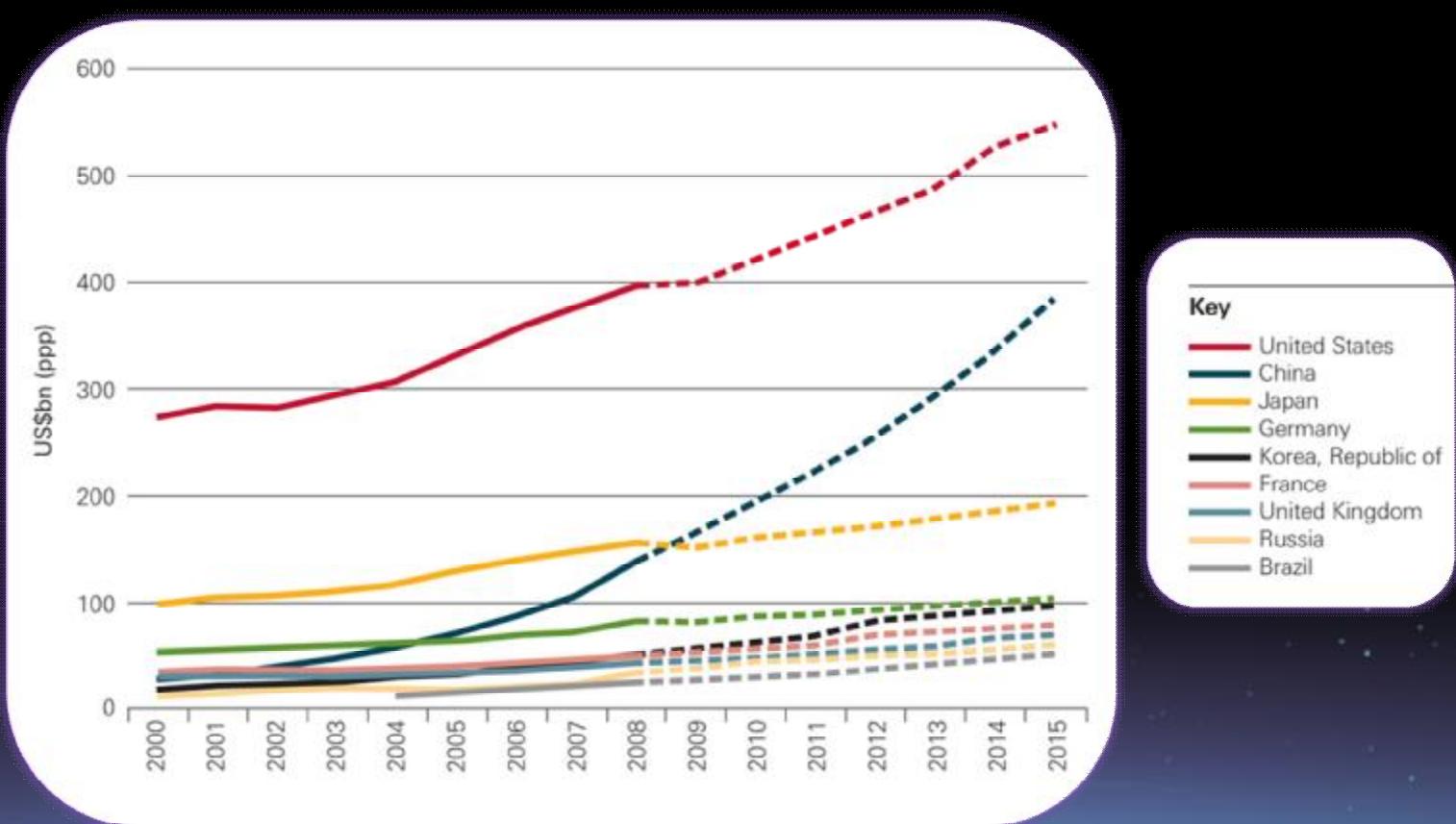
The Royal Society – “Knowledge, Networks and Nations”, 2011



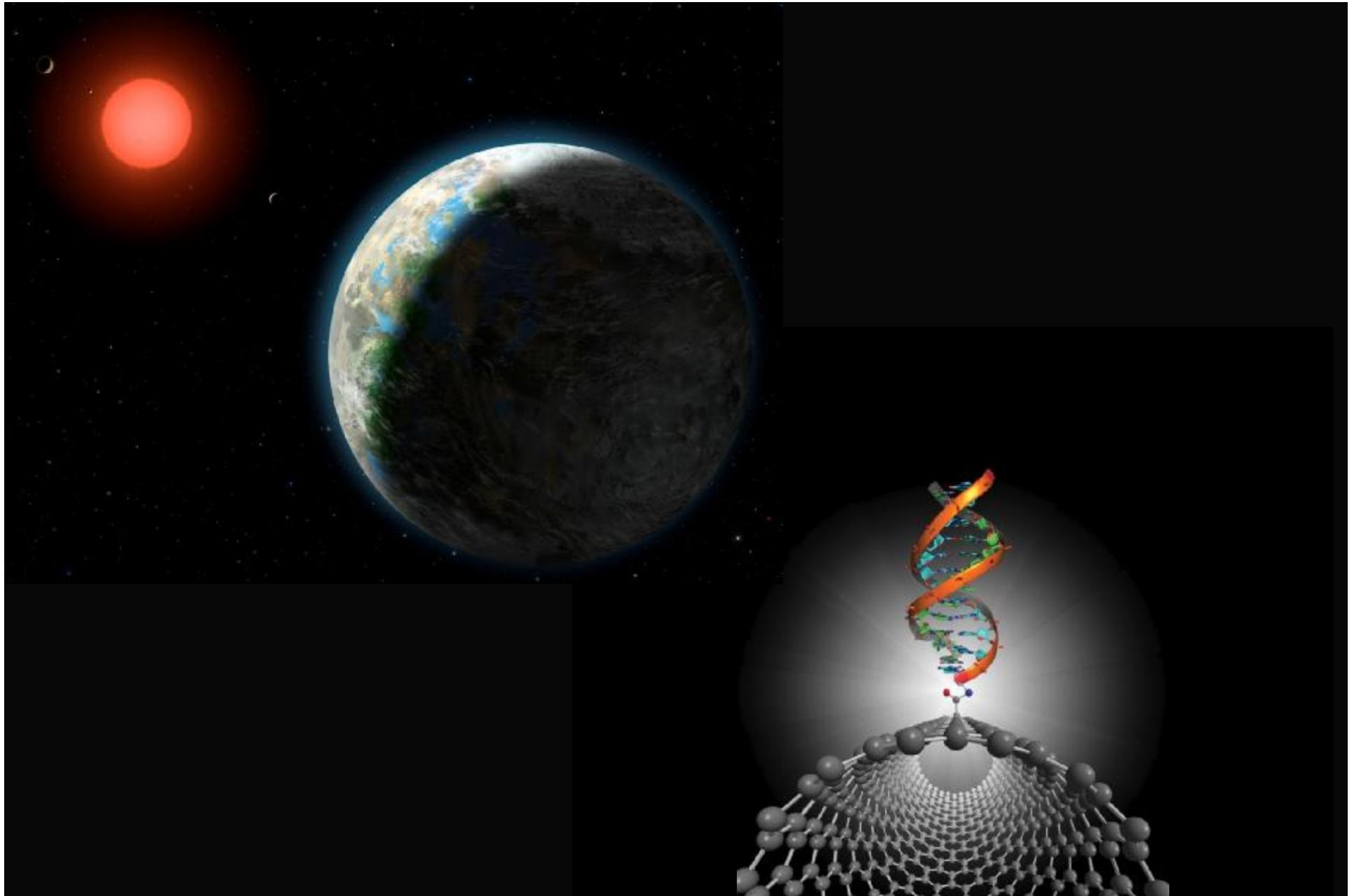
R&D Spending Targets

R&D Spending, Selected Countries 2000-2015

The dotted lines indicate projections based on announced targets



The Royal Society – “Knowledge, Networks and Nations”, 2011



New “Era of Observation”



New “Era of Data and Information”

Looking Ahead – Measurements in the context of



- Cyberinfrastructure
- Social Sciences
- Partnerships
- Human Capital Development
- “Innovation”



Cyberinfrastructure



Role in advancing measurement and assessment research

Need to store, integrate, sort, extract and archive information

Protecting the integrity of the scientific process

Accelerating discovery

Level the playing field within society and across the globe

Important tools for decision making by governments

Open access, real-time data networks

STARMetrics

Cyberinfrastructure Framework for 21st Century Science and Engineering (CIF21)

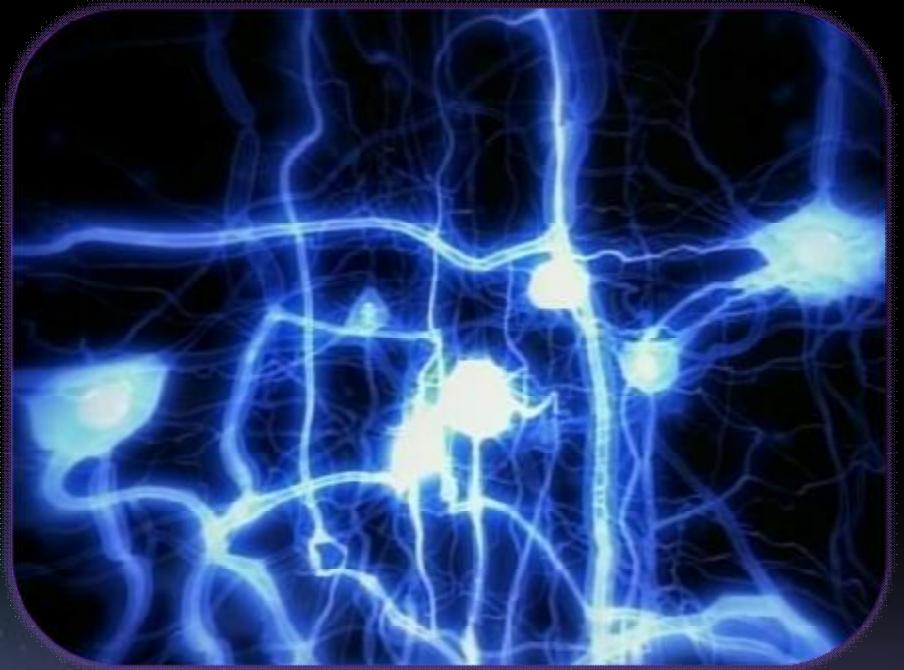


Enabling new ways
of doing science
and education



Computational and data-enabled science and engineering
(CDS&E)

Research in the Social Sciences



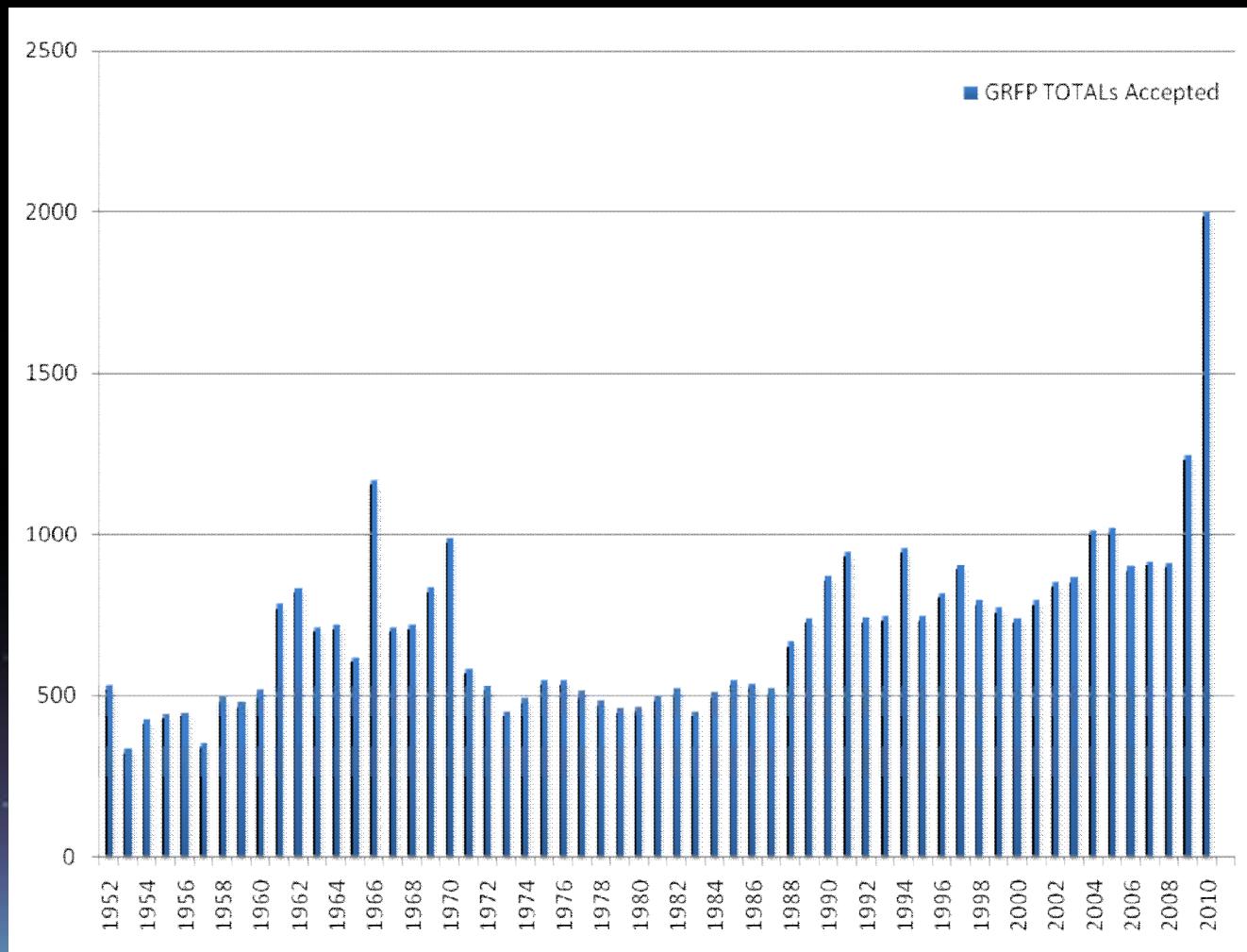
New Partnerships and Collaborations



Data-sharing among agencies, public-private partnerships

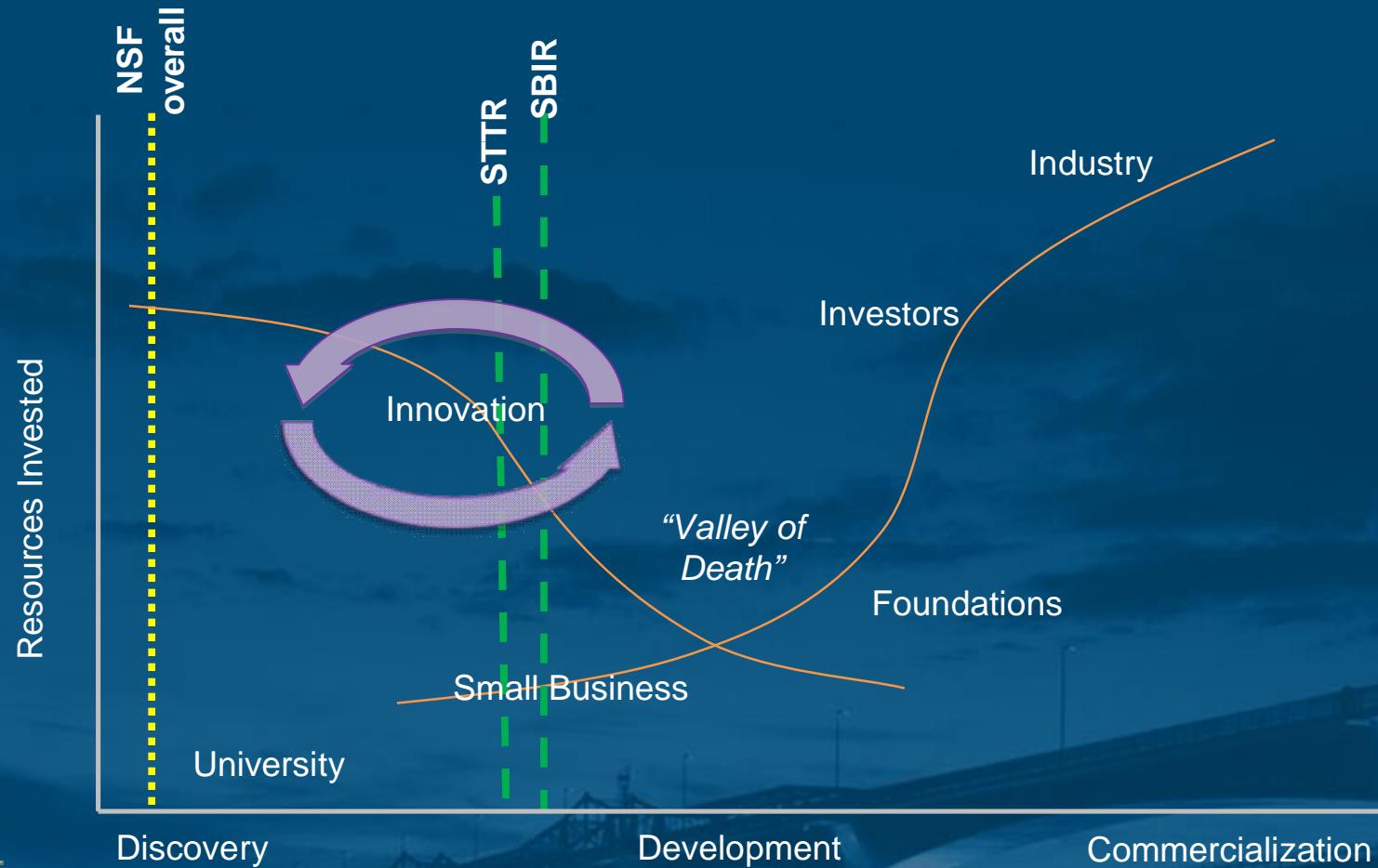
International standards and practices for measurement of impact

Number of NSF Graduate Research Fellowships



Fundamental Research as fuel for market-viable innovation

Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR)



INSPIRE: Integrated NSF Support Promoting Interdisciplinary Research and Education



Merit review system and the assessment of its effectiveness

Looking Ahead



- Cyberinfrastructure
- Social Sciences
- Partnerships
- Human Capital Development
- Measuring and quantifying “innovation”



If Measurement is the Answer, What is the Question?

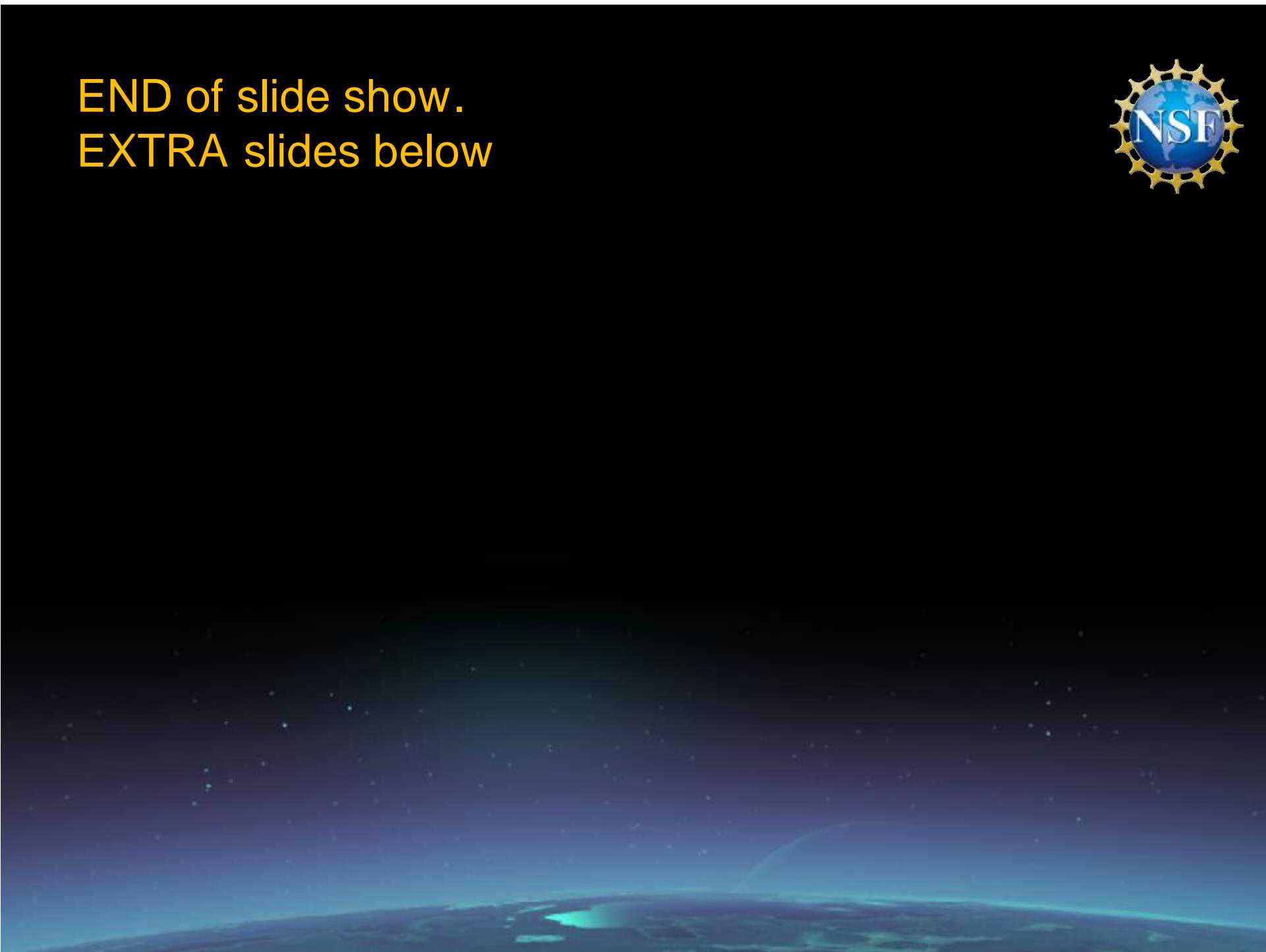
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END of slide show.
EXTRA slides below





Global Citations by Country

Comparative Proportion of Global Citation by Country

The top ten cited countries in each period are shown.

Fig a. 1999-2003

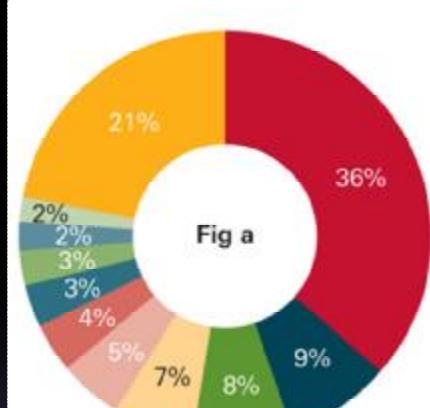
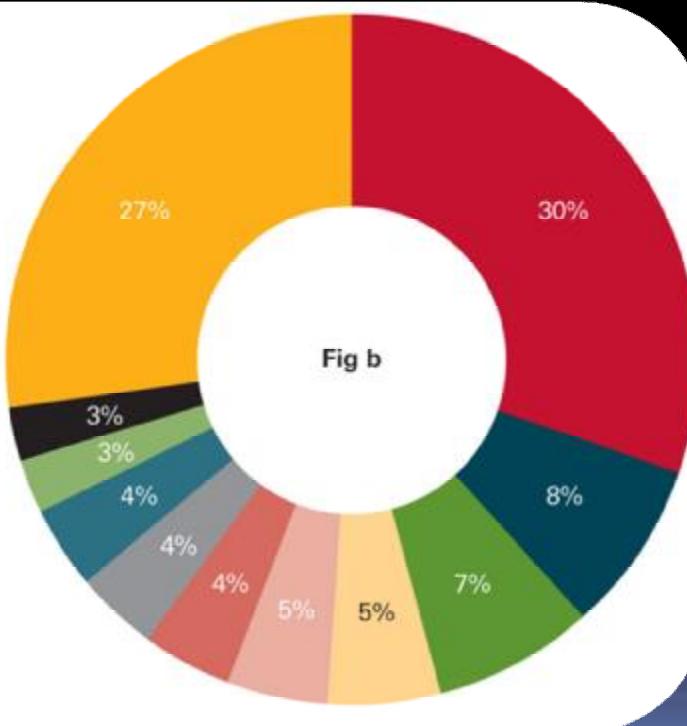


Fig b. 2004-2008



Key

Country
United States
United Kingdom
Germany
Japan
France
Canada
Italy
Netherlands
Australia
Switzerland
China
Spain
Other

Global Publication Authorship by Country



Proportion of Global Publication Authorship by Country

The top ten producing countries in each period are shown.

Fig a. 1999-2003

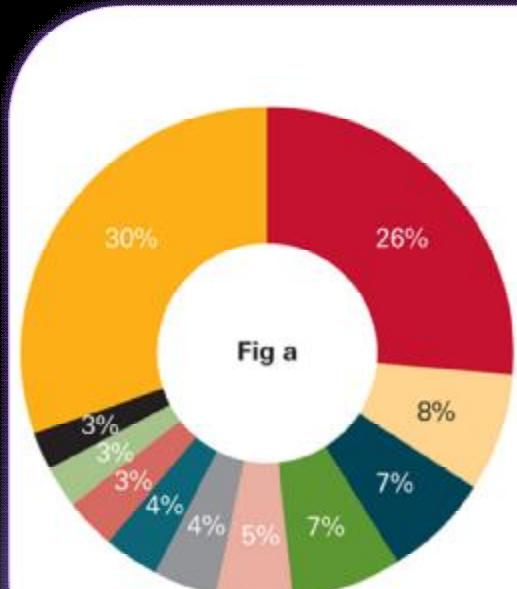
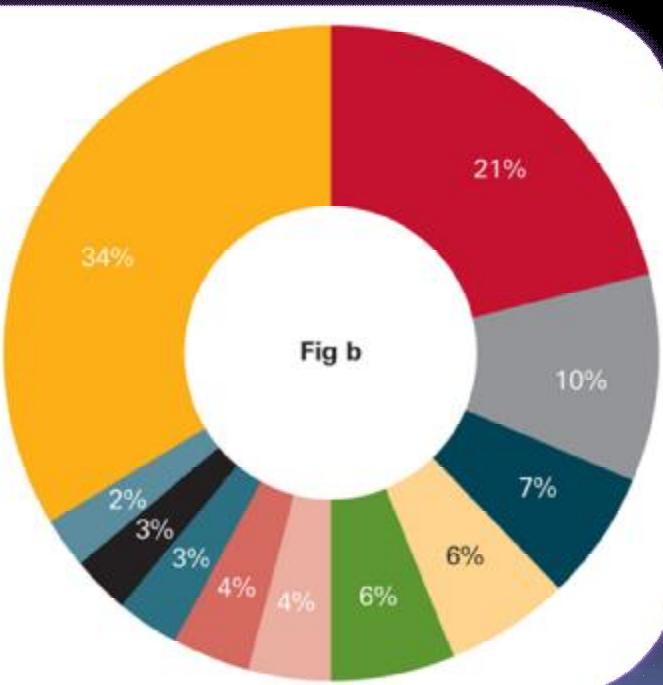


Fig b. 2004-2008



Key

United States
Japan
United Kingdom
Germany
France
China
Italy
Canada
Russian Federation
India
Spain
Other