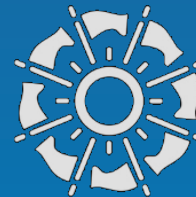


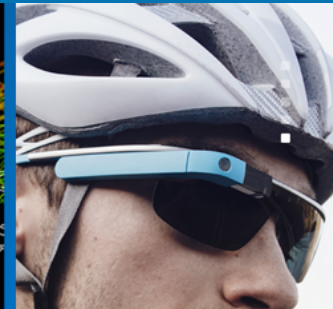
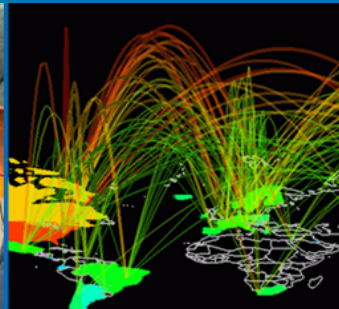
Photonics 2064

Shaping the Future of Optics & Photonics

The International Year of Light and Light-based Technologies 2015



INTERNATIONAL
YEAR OF LIGHT
2015



John Dudley

International Year of Light Steering Committee

European Physical Society

FEMTO-ST Université de Franche-Comte-CNRS

Why 2015?

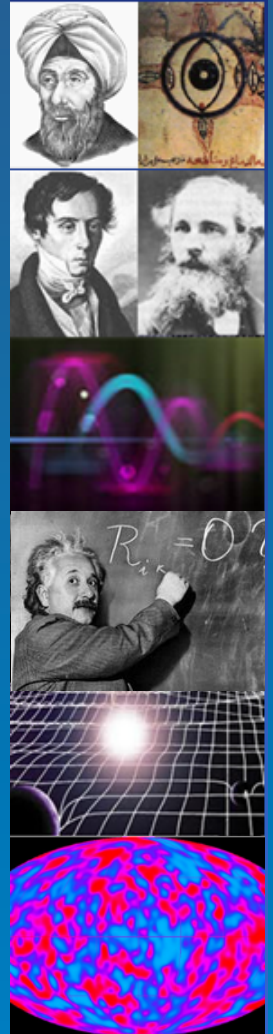
1015: 1000 years of Arabic optics

1815: 200 years of Fresnel's theory of diffraction

1865: 150 years since Maxwell's electrodynamics

1915: Einstein Centenary, General Relativity.

1965: CMB, Penzias & Wilson
Optical Fibre Technology, Charles Kao





United Nations
Educational, Scientific and
Cultural Organization

International
Year of Light
2015

SEARCH WEBSITE



HOME

ABOUT THE
YEAR OF LIGHT

EVENT
PROGRAMME

WHY LIGHT
MATTERS

LEARN ABOUT
LIGHT

HANDS ON
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COSMIC
LIGHT

LIGHT FOR
DEVELOPMENT

SCIENCE
STORIES



LEARN ABOUT
IYL2015 & UNESCO



NATIONAL
CONTACT POINTS



RESOURCES TO
GET ORGANISED

Opening Ceremony
- 19-20 January
2015

Women In Science

Study After Sunset

IYL2015 Photo
Contest

EVENT CALENDAR

- Aug 12. 8th International Conference on Photonics and Applications
Da Nang City, Vietnam
- Aug 17. SPIE Optics & Photonics
San Diego, United States
- Sep 1. 2nd International Symposium on Optics and its Applications
Yerevan-Ashtarak, Armenia

Founding
Partners



Endorsed
by



We will only have one chance

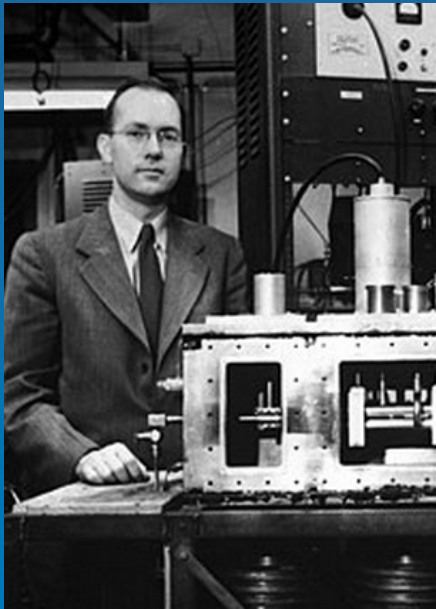
2015 represents a unique opportunity for the optics community to show its vision for the future

Outreach to students and the public is important, but also important is the more difficult task of political engagement

If we miss this chance to promote the importance of science to a political audience, we will only have ourselves to blame...

Engaging more widely

The example of Charles Townes



I have always felt that scientists should provide public service from time to time, and so I agreed to go to Washington to help monitor American scientific work....

How the Laser Happened: Adventures of a Scientist.

Advice is most credible when delivered by working scientists

Independent non-partisan values are increasingly rare

Resistance to basic research

"All the News
That's Fit to Print"

The New York Times.

LATE CITY EDITION
Printed at the Times Building
1230 Avenue of the Americas
New York 10, N. Y.

VOL. XLIV—No. 100

REG. U.S. PAT. OFF.

NEW YORK, SUNDAY, AUGUST 7, 1945.

THREE CENTS PER COPY

FIRST ATOMIC BOMB DROPPED ON JAPAN

SCIENCE AND THE BOMB

University professors who are opposed to organizing, planning and directing research after the manner of industrial laboratories because in their opinion fundamental research is based on "curiosity" and because great scientific minds must be left to themselves have something to think about. A most important piece of research was conducted on behalf of the Army by precisely the means adopted in industrial laboratories. And the result? An

invention is given to the world in three years which it would have taken perhaps half a century to develop if we had to rely on prima donna research scientists who work alone. The internal logical necessities of atomic physics and the war led to the bomb. A problem was stated. It was solved by team work, by planning, by competent direction and not by a mere desire to satisfy curiosity.

How will funding evolve by 2064?

1945 - Vannevar Bush

Manhattan Project

Science: The Endless Frontier

1945 report (Roosevelt – Truman)



“Basic research is the pacemaker of technological progress”

Basic Research

Applied Research

Development

Production

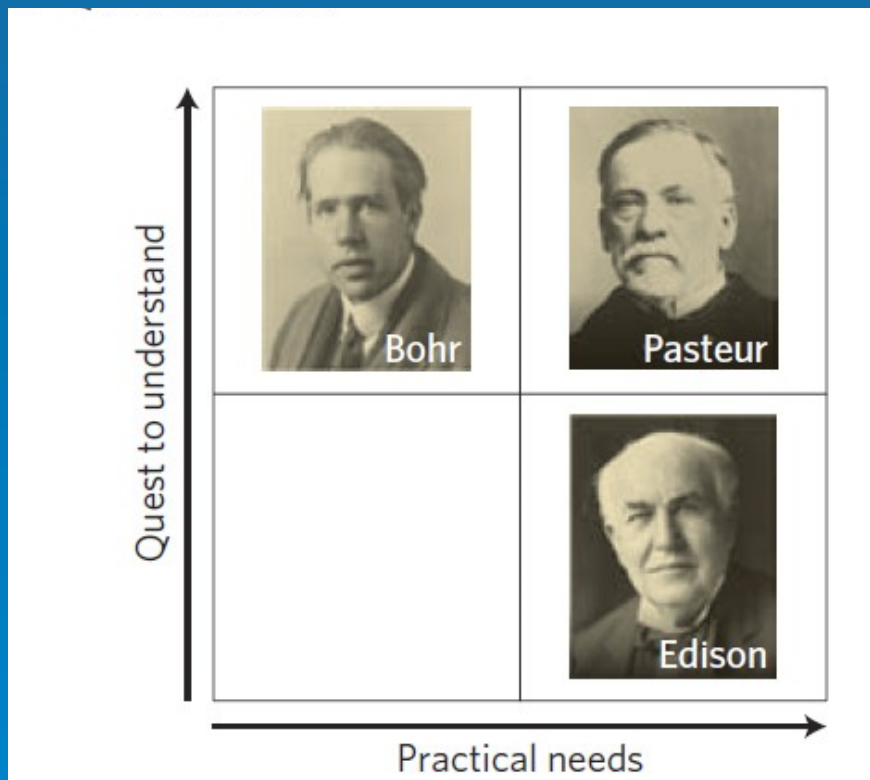
In today's terminology – the value chain ...

Funding models of the future?

1997 - Donald Stokes

Pasteur's Quadrant - Basic Science & Technological Innovation

Add an extra dimension to represent more complex interactions

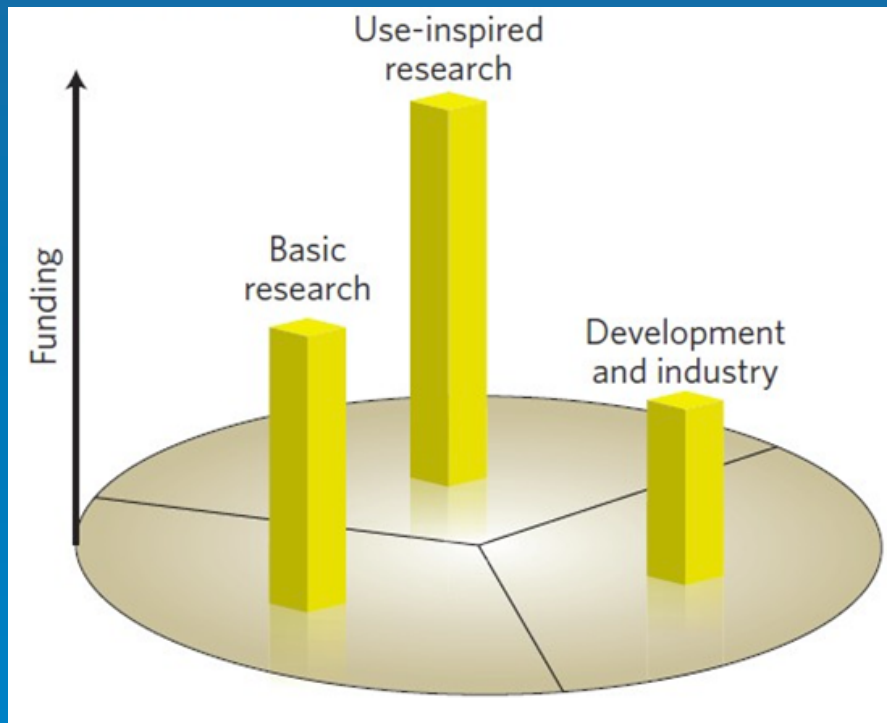


This is the origin of “end-user inspired” research funding ... relevance, societal needs, impact etc

Funding models of the future?

2014 – Horizon 2020

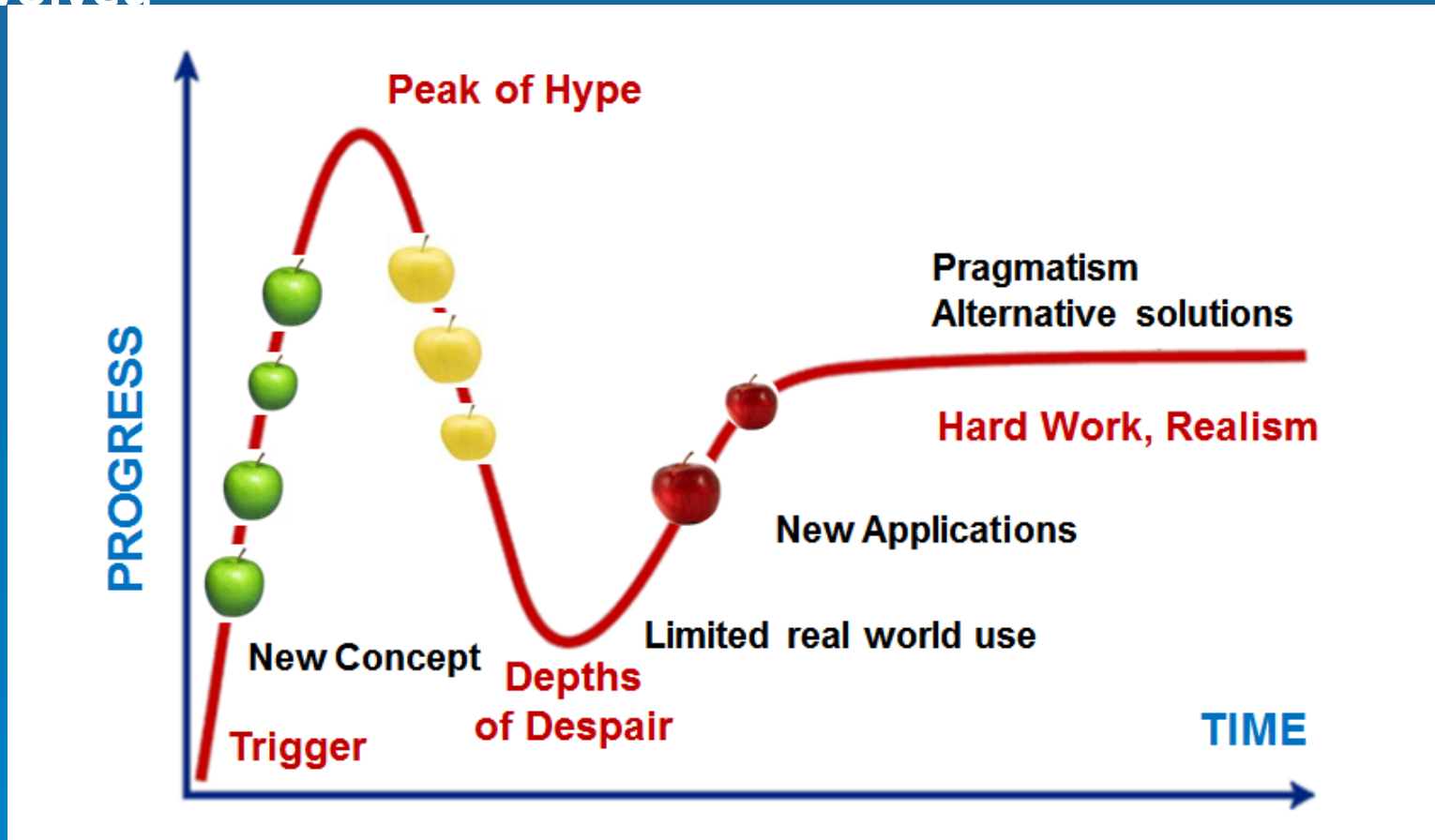
Realization that basic research can influence industry directly



Removing the boundaries in practice is a lot more difficult

Funding models of the future?

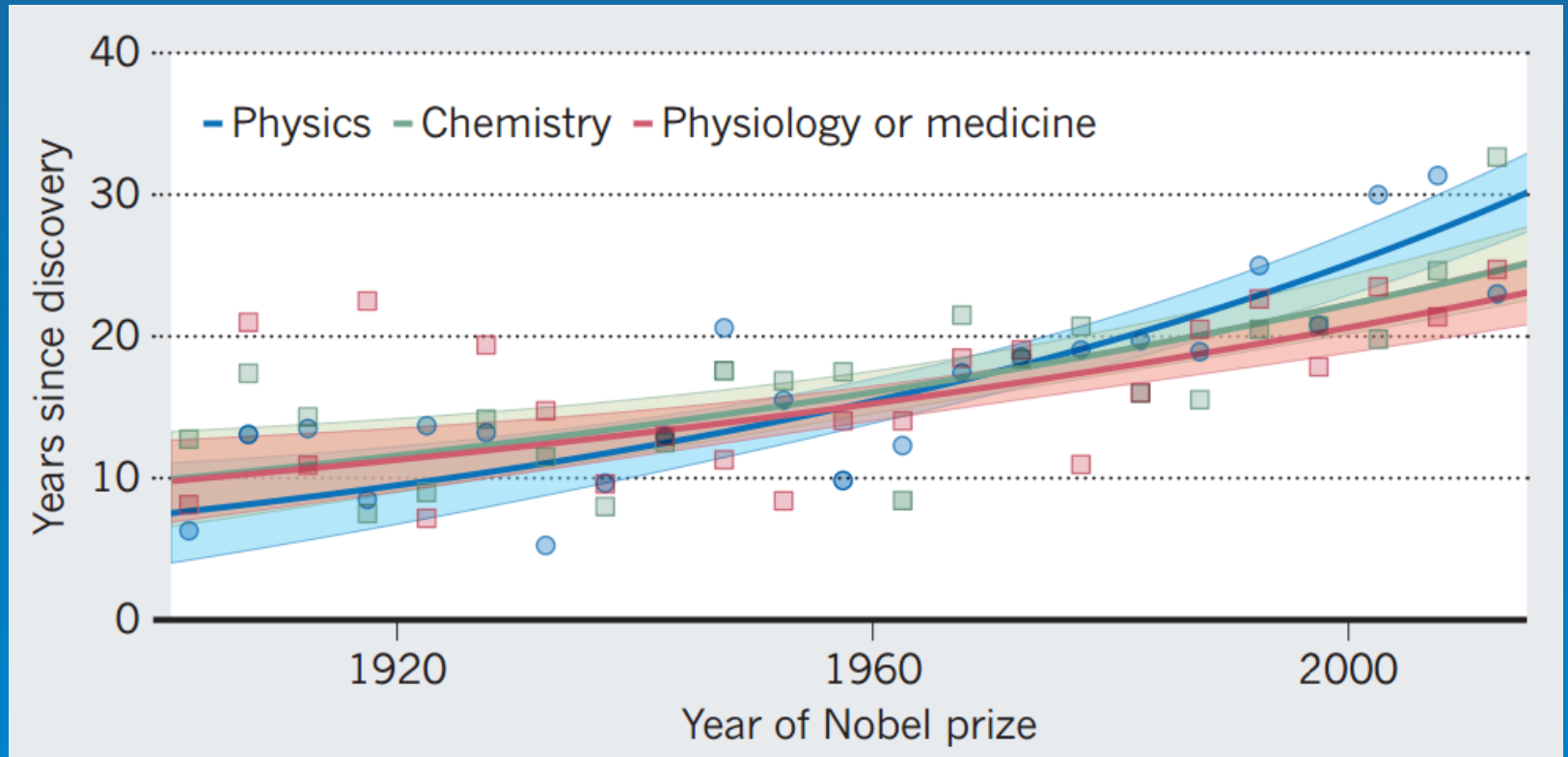
We need to remind decision-makers of the timescales involved



Funding models of the future?

We need to remind decision-makers of the timescales involved

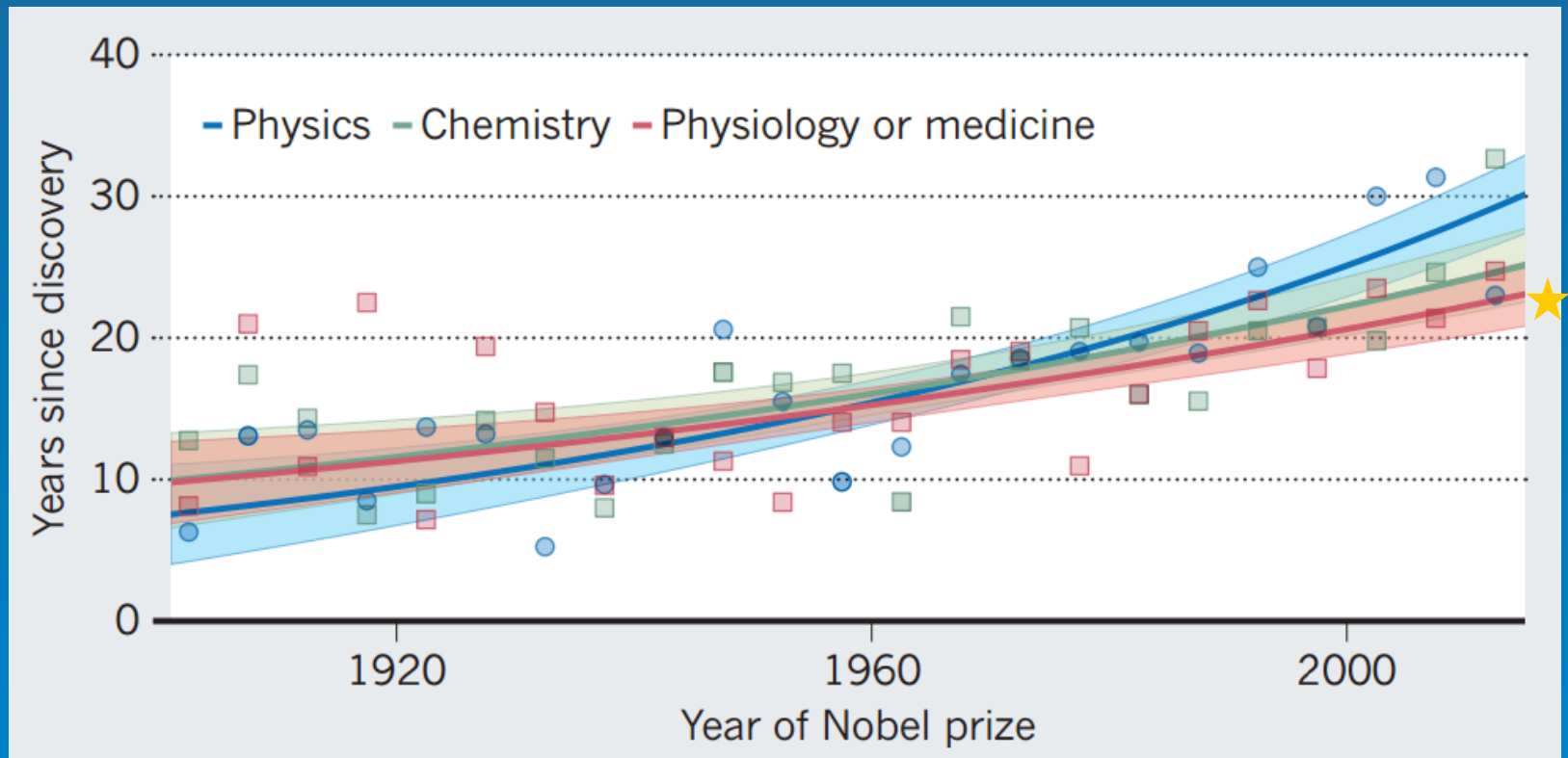
Years between original discovery and award of Nobel Prize



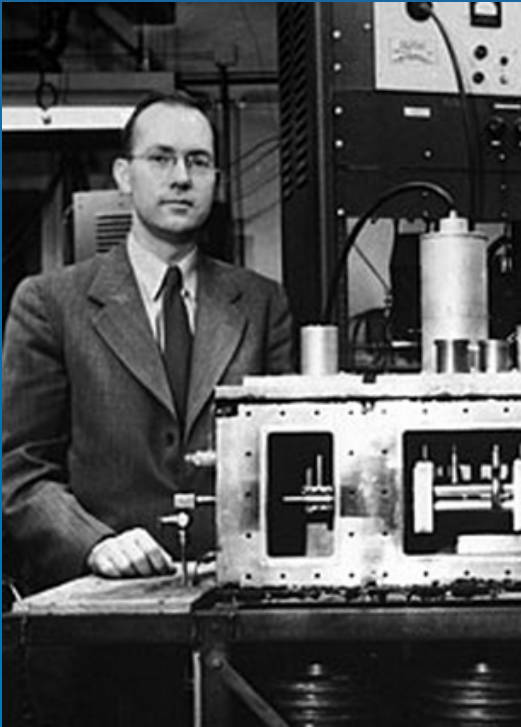
Funding models of the future?

We need to remind decision-makers of the timescales involved

Years between original discovery and award of Nobel Prize



What about the research process?

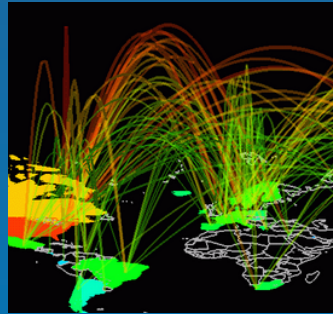


Discovery is multifaceted

What path to explore is important, as well as what we notice along the path. And there are always unturned stones along even well-trod paths.

And the really surprising discoveries will probably depend primarily on individuals, not teams or committees even though the individual may be part of a team.

Now is an ideal time to promote physics



The last International Year on any kind of physics theme for quite a while ...

We must make the most of this