

# Science, Philanthropy and Society

Nathaniel J. (Nat) Fisch Symposium

“Solved and Unsolved Problems in Plasma Physics”  
Princeton University

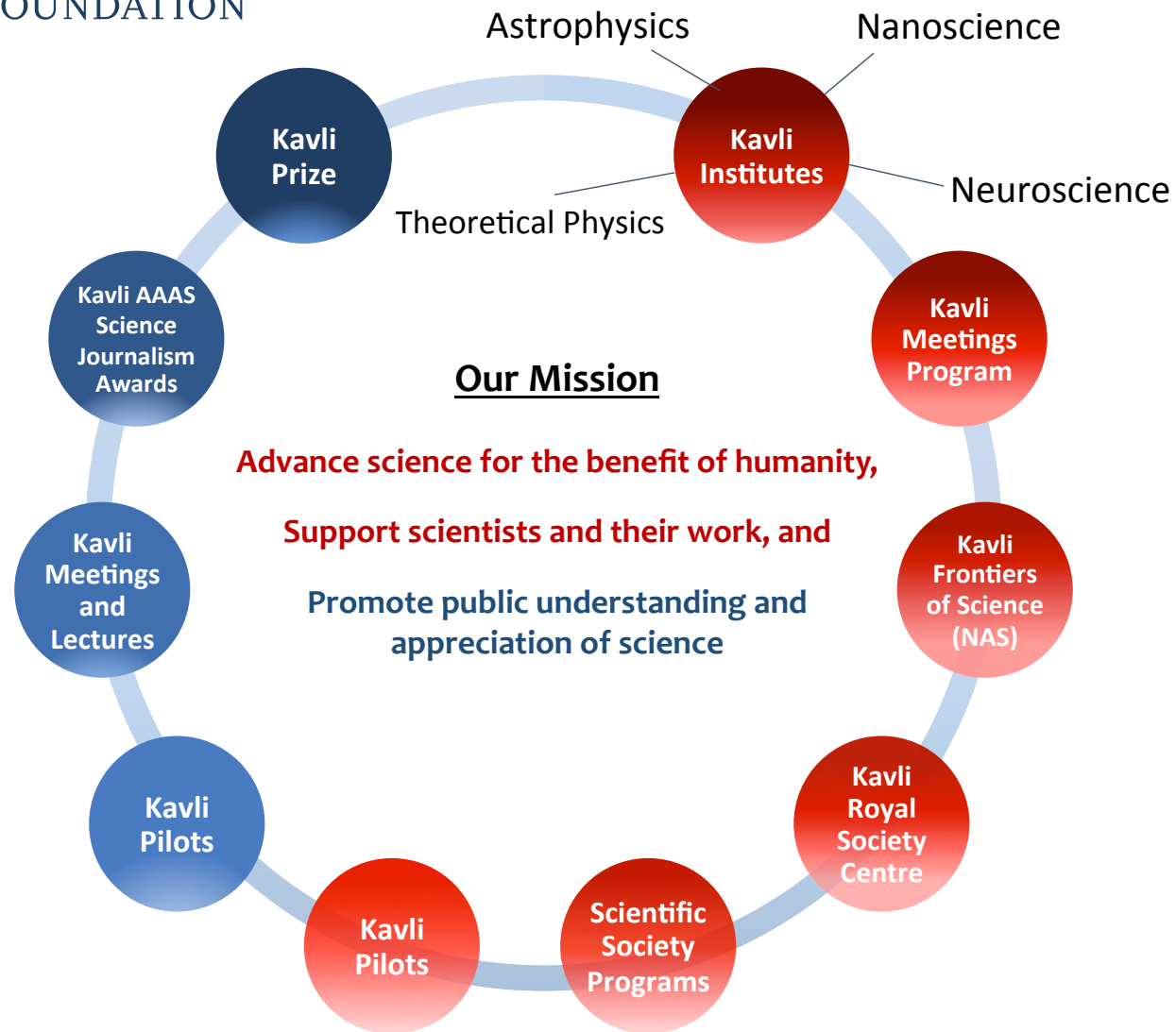
Robert W. Conn

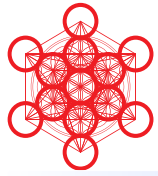
President and CEO, The Kavli Foundation

March 29, 2016



*The Kavli Foundation is dedicated to advancing science for the benefit of humanity, promoting public understanding of scientific research, and supporting scientists and their work.*





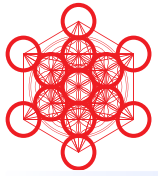
## Governments Understand that Support for Science and Technology is Important

### Galileo and The Doge of Venice



Fresco by Bertini

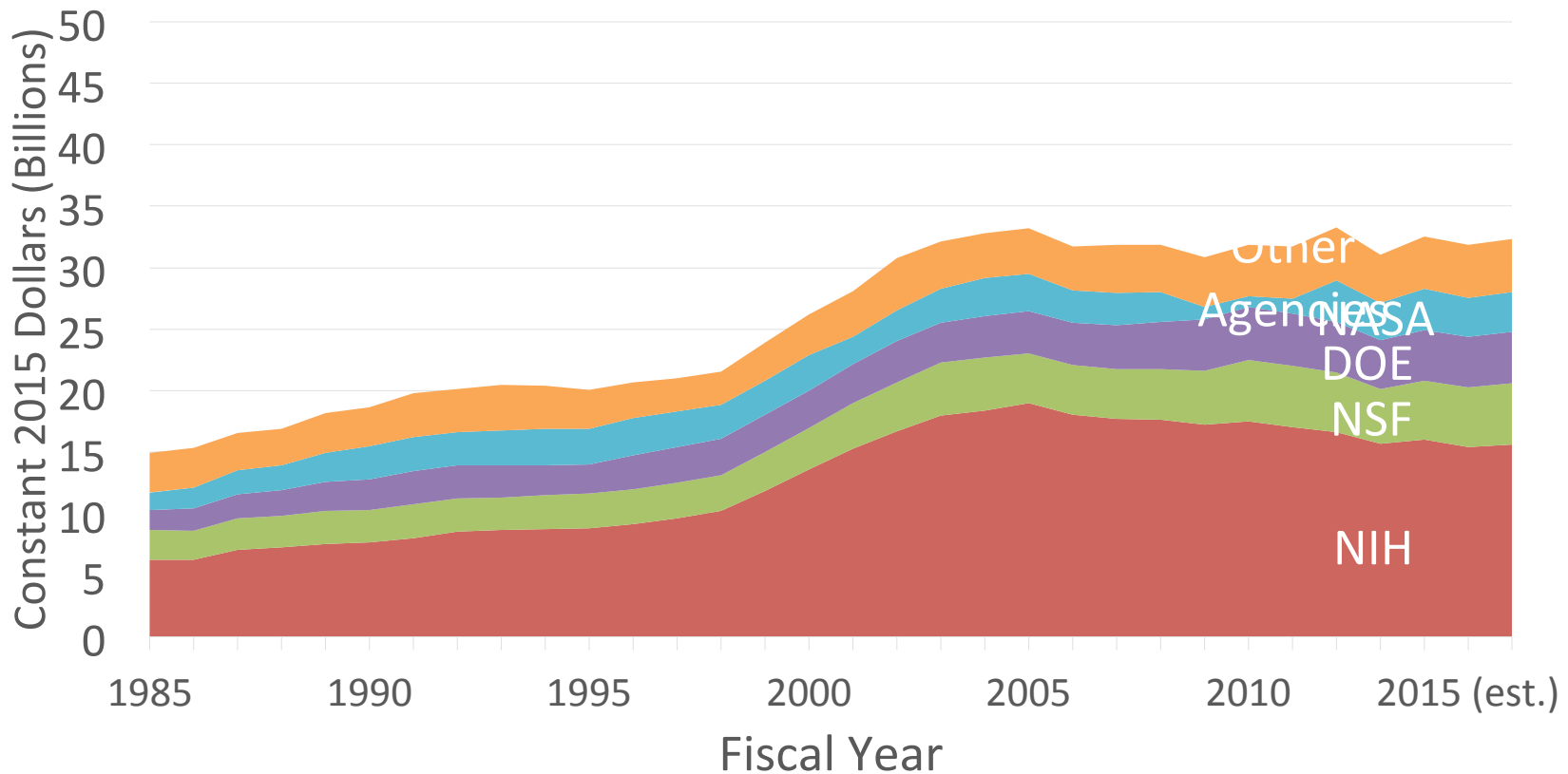
[http://commons.wikimedia.org/wiki/File:Bertini\\_fresco\\_of\\_Galileo\\_Galilei\\_and\\_Doge\\_of\\_Venice.jpg](http://commons.wikimedia.org/wiki/File:Bertini_fresco_of_Galileo_Galilei_and_Doge_of_Venice.jpg)

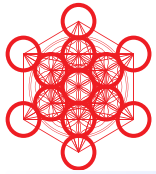


Today, Government Funding for Science is Large but has been Flat for a Decade. **And There has been a Shift from Basic to Applied.**

## U.S. Basic Research Funding by Source

Source: AAAS and NSF Sci & Eng. Indicators 2016

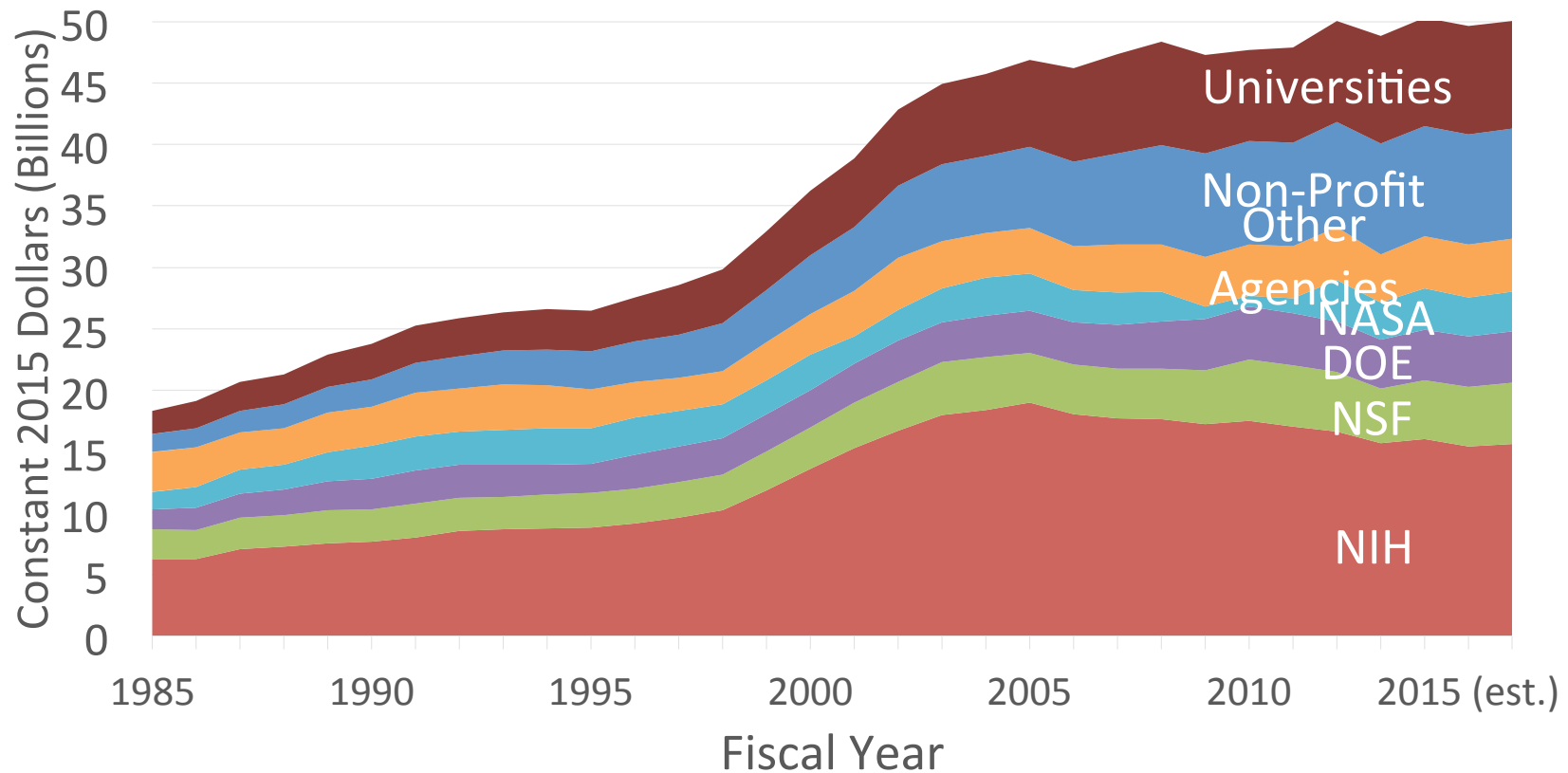


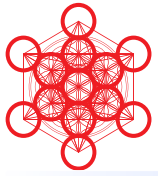


## Surprisingly, Universities and Non-Profits Provide Almost \$18 Billion a Year for Basic Research

### U.S. Basic Research Funding by Source

Source: AAAS and NSF Sci & Eng. Indicators 2016

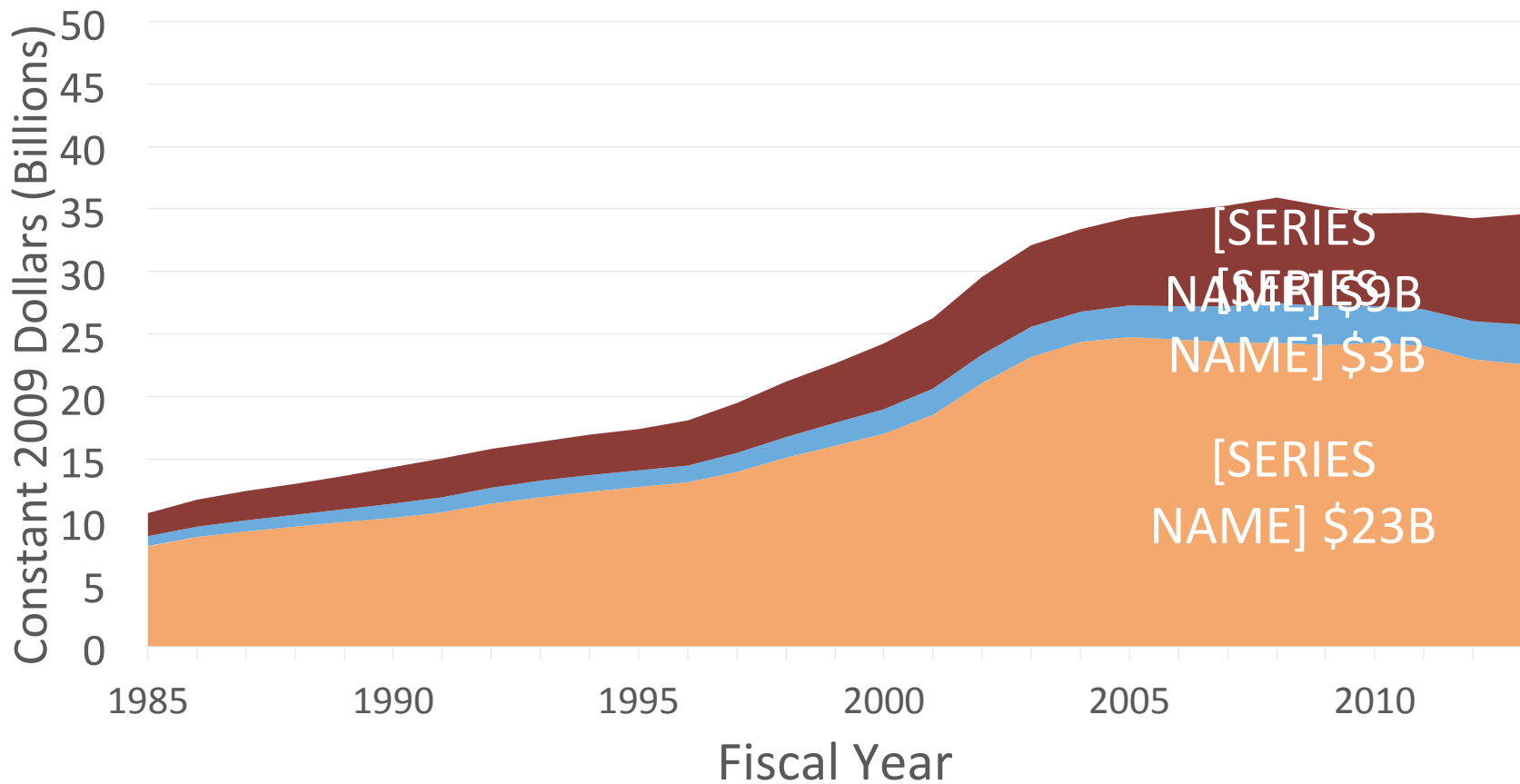


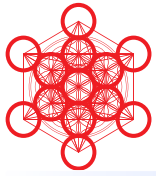


## America's Universities Receive \$35 Billion Annually for Basic Research. **But this too has been Flat for a Decade**

### U.S. Basic Research **at Universities** Funding by Source

Source: AAAS and NSF Sci & Eng. Indicators 2016

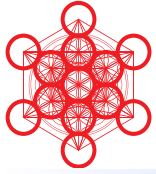




## Philanthropic Giving Over More than a Century Helps Underwrite the Operating Budgets of Universities

	<u>School</u>	<u>Endowment</u>	<u>Annual Payout (5%)</u>
1	Harvard University	\$36,429,000,000	\$1,821,000,000
2	Yale University	\$23,859,000,000	\$1,193,000,000
3	Stanford University	\$21,466,000,000	\$1,073,000,000
4	Princeton University	\$20,576,000,000	\$1,029,000,000
5	MIT	\$12,425,000,000	\$621,000,000
6	Texas A&M University	\$10,521,000,000	\$526,000,000
7	University of Michigan	\$9,604,000,000	\$480,000,000
8	University of Pennsylvania	\$9,582,000,000	\$479,000,000
9	Columbia University	\$9,223,000,000	\$461,000,000
10	University of Notre Dame	\$8,189,000,000	\$409,000,000
	Source: US News and World Report (2014 Data)		



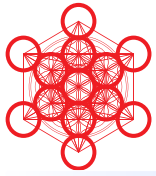


## Philanthropy in American Society

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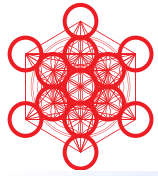
*From Carnegie's Famous Admonition of 1901 to  
the Gates-Buffett Giving Pledge of 2010 –*

Giving Back is an American Cultural Imperative



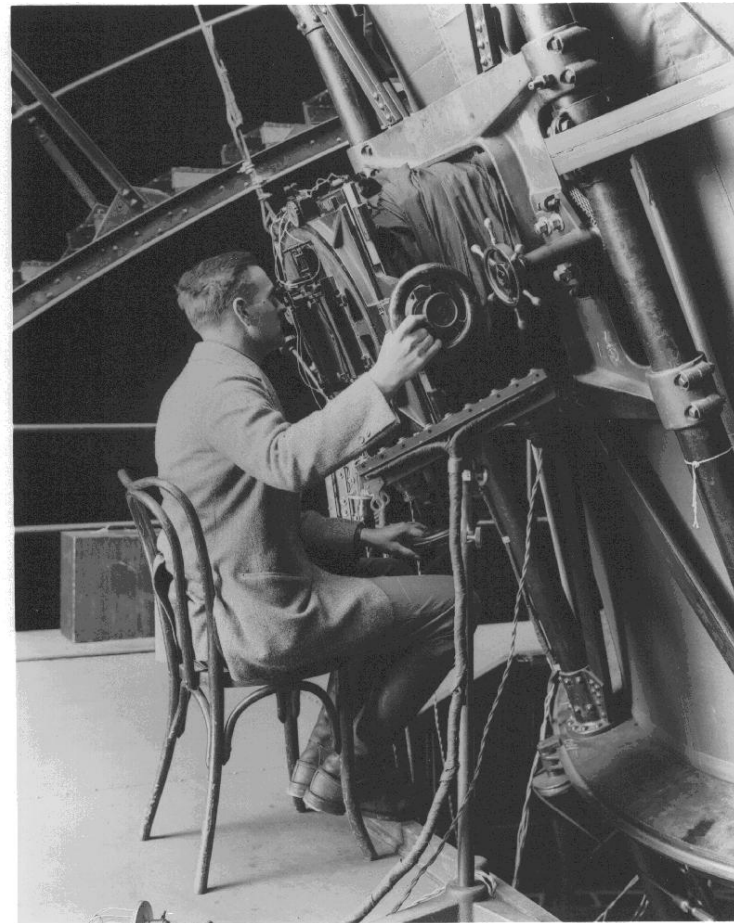
## Philanthropy Has Been a Central Element of Science Funding For More than a Century

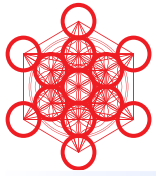
Pre 1950s - Examples	Post 1950s - Examples
<ul style="list-style-type: none"><li>• Andrew Carnegie</li><li>• George Eastman</li><li>• Henry Ford</li><li>• Solomon Guggenheim</li><li>• Howard Hughes</li><li>• W. M. Keck</li><li>• John D. Rockefeller</li></ul>	<ul style="list-style-type: none"><li>• Paul Allen</li><li>• Eli and Edythe Broad</li><li>• Irwin and Joan Jacobs</li><li>• Fred Kavli</li><li>• Gordon and Betty Moore</li><li>• David and Lucile Packard</li><li>• James and Marilyn Simons</li><li>• Alfred P. Sloan</li></ul>



## Philanthropy Matters for Science

Andrew Carnegie, George Hale, Edwin Hubble and  
the Discovery of the Expanding Universe

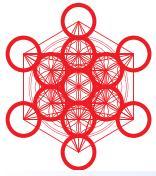




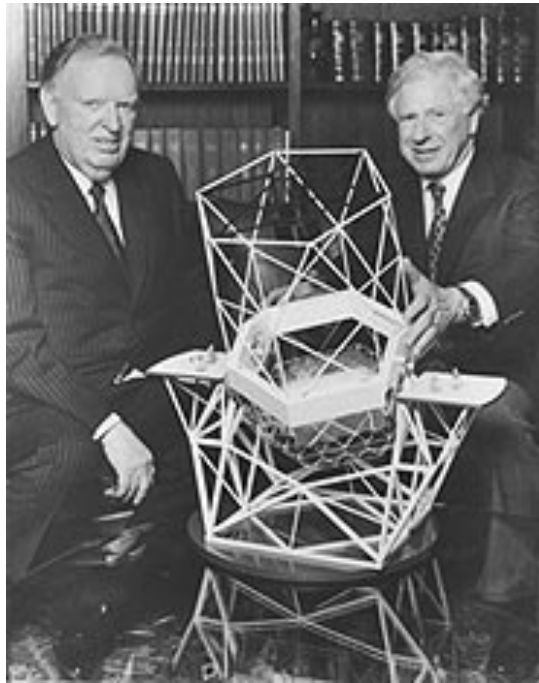
## E.O. Lawrence (Right), M.S. Livingston and the Cyclotron. Understanding the Nucleus and Creating New Elements



Some of Lawrence's Earliest Funds in the 1930's Came from the Research Corporation (RCSA), and the Macy and Rockefeller Foundations –

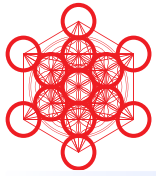


## W. M. Keck and the Keck10 Meter Observatory

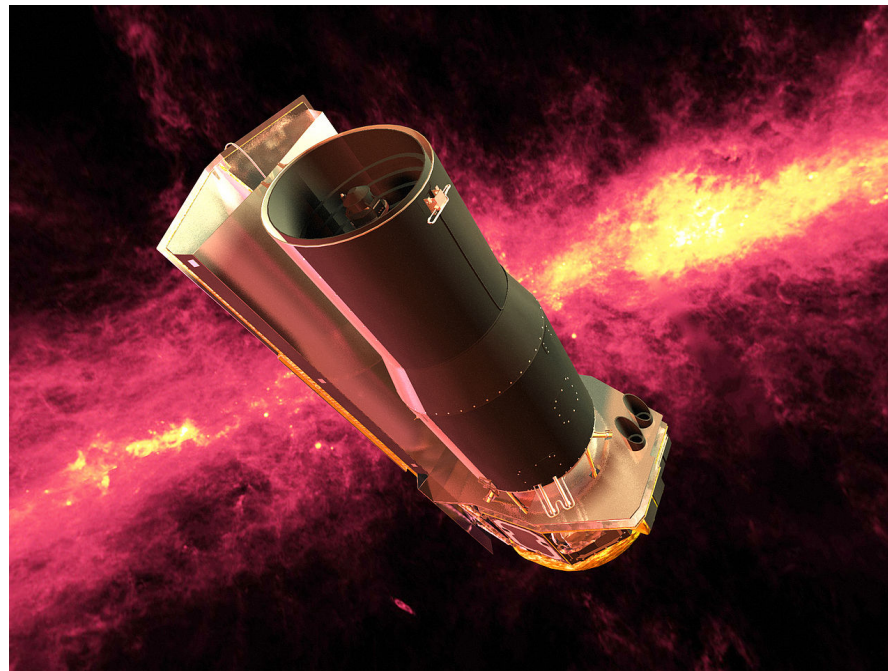


Today, Philanthropic Support for the 30 Meter Telescope comes from [Gordon Moore](#) and the [Gordon and Betty Moore Foundation](#)

The two people are W.M. Keck Jr. and Murph Goldberger (a Princeton Fixture for Many Years)

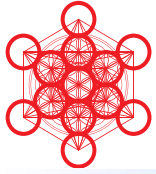


## The (Lyman) Spitzer Space Telescope



Lyman Spitzer of Princeton, one of the 20th Century's most distinguished astronomers and astrophysicists, promoted the concept of space telescopes in the 1940s

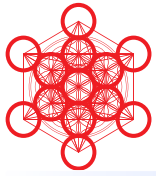
In 1951, he established Project Matterhorn at Princeton, today's Princeton Plasma Physics Laboratory.



## Philanthropy in the United States

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- All Charitable Giving in 2014: **\$360 Billion**
    - Giving by Individuals: **\$260 Billion**
    - Giving by Private Foundations: **\$55 Billion**
  - Assets of Private Foundation: **\$800 Billion**
    - Annual Foundation Expenditures : **\$55 Billion**
    - Giving by Foundations for Science, Technology, Engineering and Medicine - **~ \$3-5 Billion**
- All Data for 2014. Source: Giving USA 2015 Report and The Foundation Center statistics for 2012



# Opportunities for Philanthropy

Support Science In Pasteur’s “Upper Quadrants”.

## Inspired by The Need to Solve a Problem

No

Yes

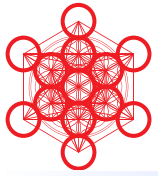
Inspired by The Need for  
Fundamental Understanding

Yes

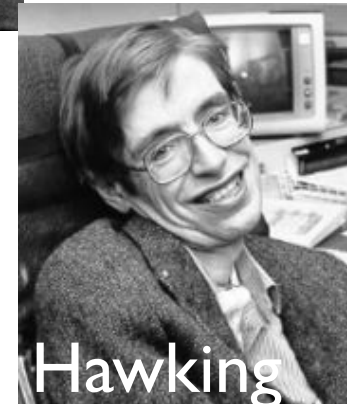
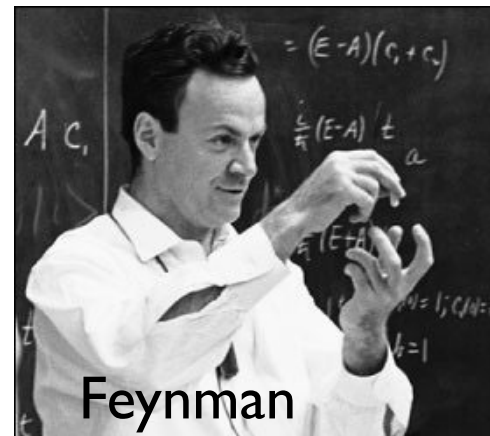
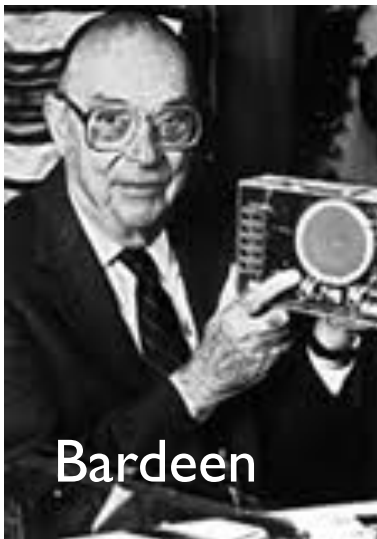
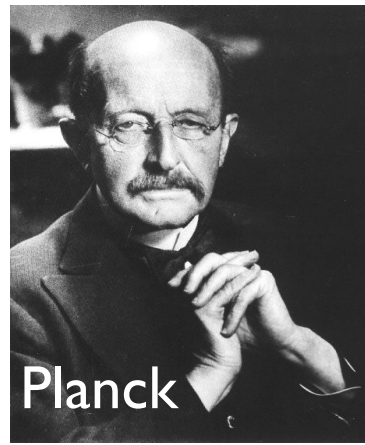
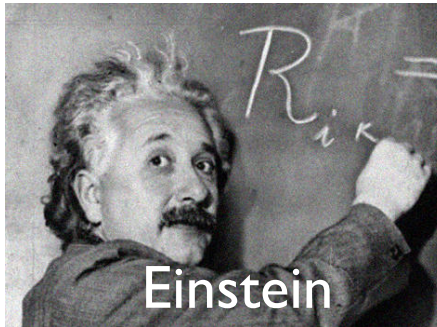
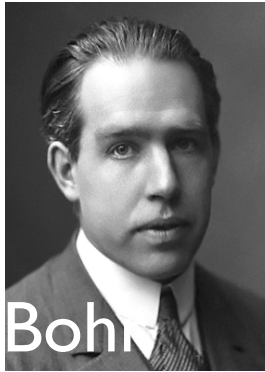
<p><b>“Fundamental” Basic Research</b></p> <ul style="list-style-type: none"> <li>Investigator: <b>Bohr</b>, Einstein, Turing, Townes, Feynman, Pauling, von Neumann, Hawking, Mendel, Cajal.</li> <li><u>Example Foundations</u>: <b>Carnegie, Broad, Rockefeller, Guggenheim, Kavli, Keck, Moore, Sloan, Simons</b></li> </ul>	<p><b>“Problem-Inspired” Basic Research</b></p> <ul style="list-style-type: none"> <li>Investigator: <b>Pasteur</b>, Morgan, Crick, Watson, Pauling, Fleming, Turing, Shannon, von Neumann, Bardeen</li> <li><u>Example Foundations</u>: <b>Rockefeller, Howard Hughes, Simons, Wellcome Trust</b></li> </ul>
<p><b>“Particular Phenomena”</b></p> <ul style="list-style-type: none"> <li>Investigator: Peterson</li> <li><u>Examples</u>: <b>Science Museums, Conservationists/Preservationists, Census by Naturalists</b></li> </ul>	<p><b>“Applications” Research</b></p> <ul style="list-style-type: none"> <li>Investigator: Edison, Siemens, Bell, Cerf &amp; Kahn</li> <li><u>Examples</u>: <b>Ford, Gates, Industry Writ Large</b></li> </ul>

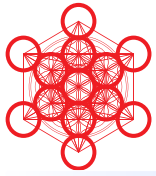
No





## Physicists Driven by The Need to Understand and the Need to Solve Problems

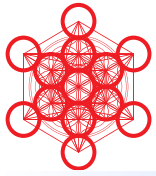




## *Looking Ahead for Science*

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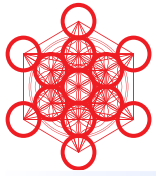


- *Six Founding Foundations*

- Howard Hughes Medical Institute
- The Kavli Foundation
- Gordon & Betty Moore Foundation
- The Simons Foundation
- Alfred P. Sloan Foundation
- Research Corp. for Science Adv.

- *Science Philanthropy Alliance Goals*

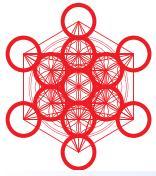
- Increase Philanthropic Support for Basic Science
- Work with American's Research Universities and Private Research Institutions to Ensure Support for Basic Science is Strong



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The **Science Philanthropy Alliance** will Make the Case  
To Philanthropists on Behalf of Basic Science

History Suggests Optimism That Much  
New Wealth will be Given Back for the Benefit of Society



Congratulations, Nat