Fostering Discoveries and Discoverers

(AKA "Strengthening the Core")

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National Science Foundation

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Senior Advisor, Office of the Director
National Science Foundation

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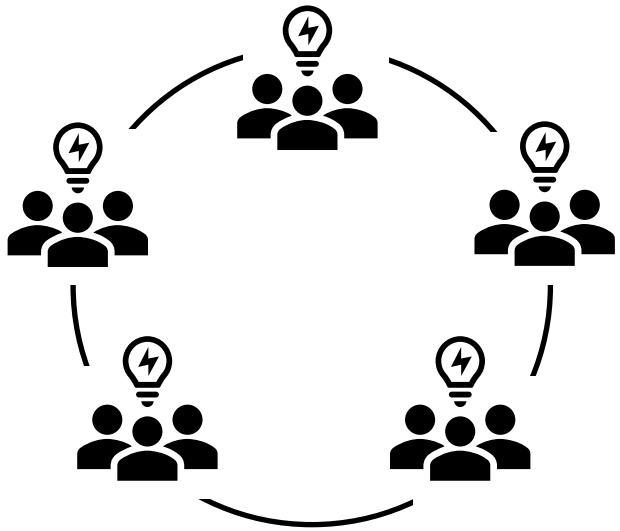
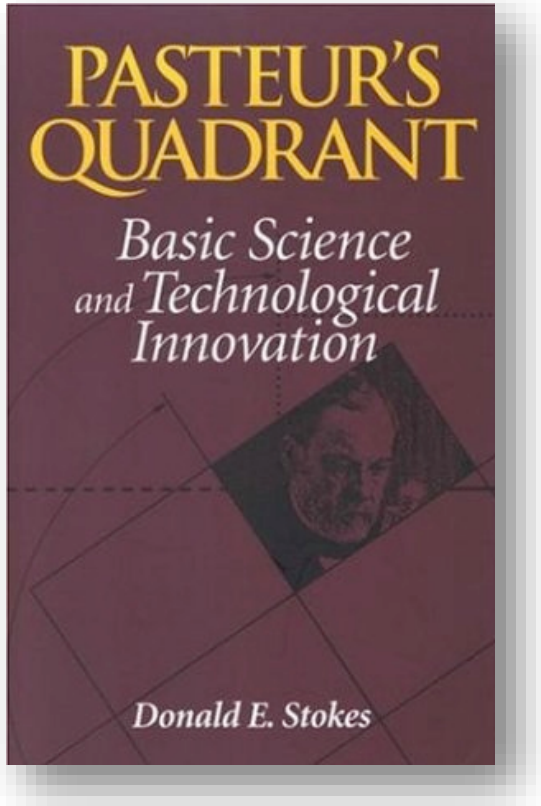
What about the "core"?

Some thoughts

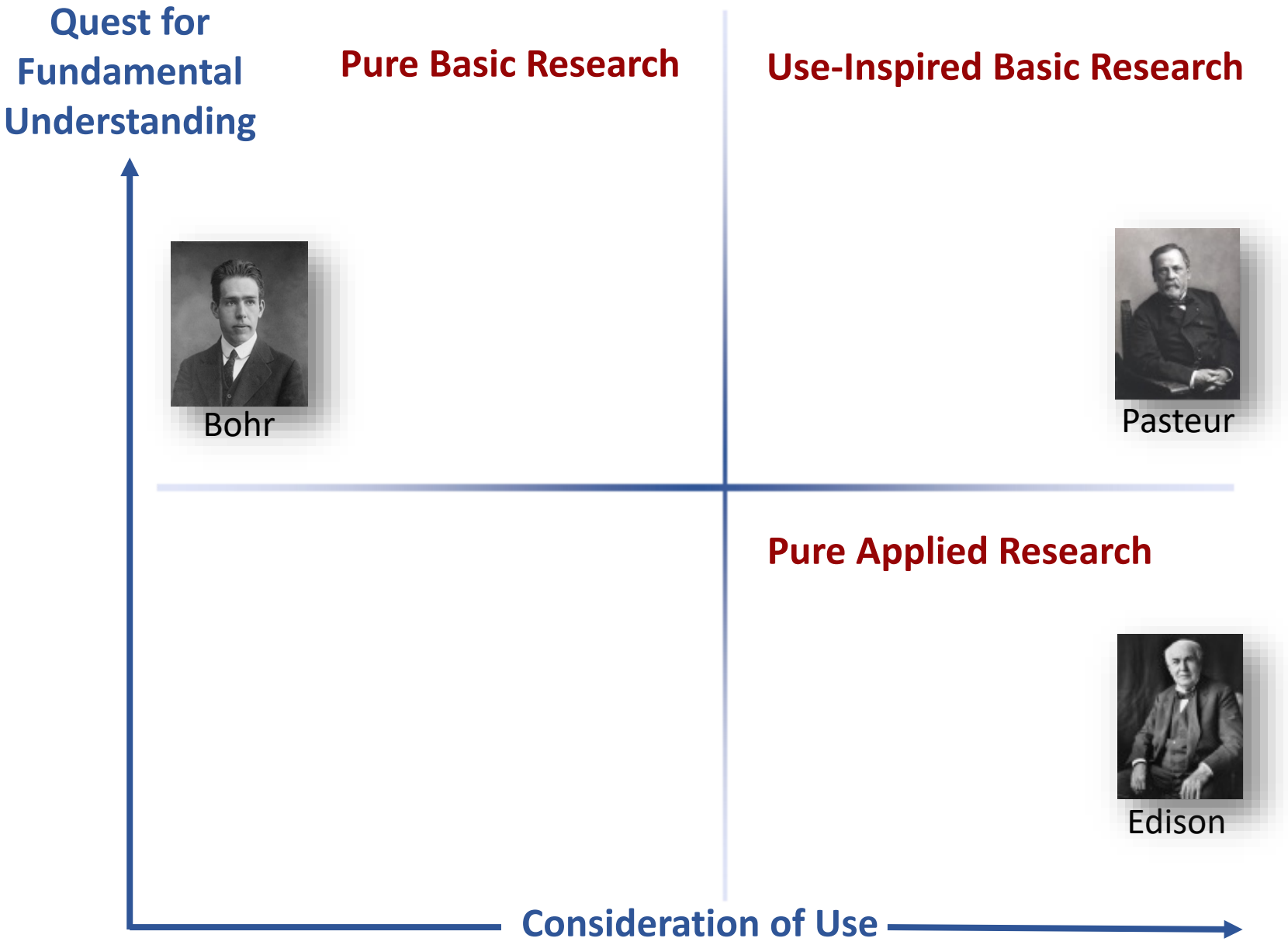


- Investigator or community initiated
- Driven by curiosity
- Basic or fundamental
- Responds to continuing programs
- Constantly evolving at the frontiers of discovery
- A defining characteristic of NSF – the core mission

Quest for Fundamental Understanding



Consideration of Use


Quest for Fundamental Understanding
Pure Basic Research
Use-Inspired Basic Research
Bohr
Pasteur
Pure Applied Research
Edison
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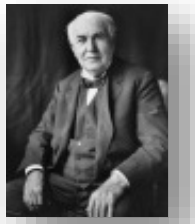

Edison

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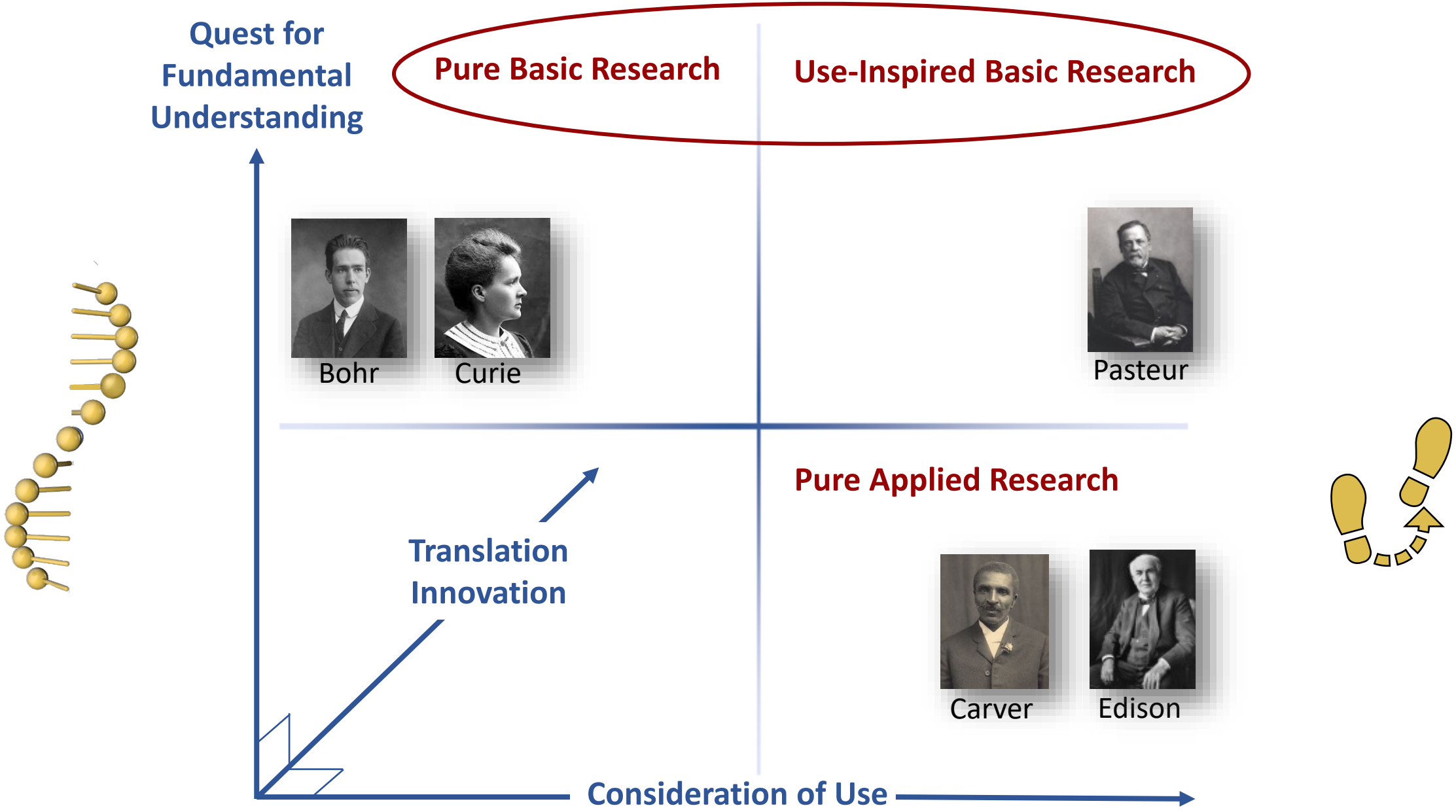
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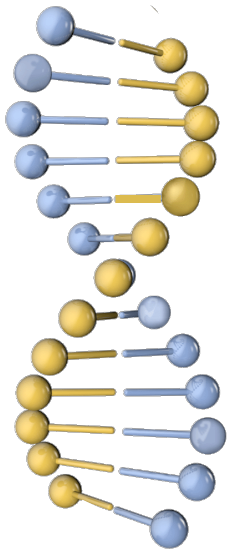

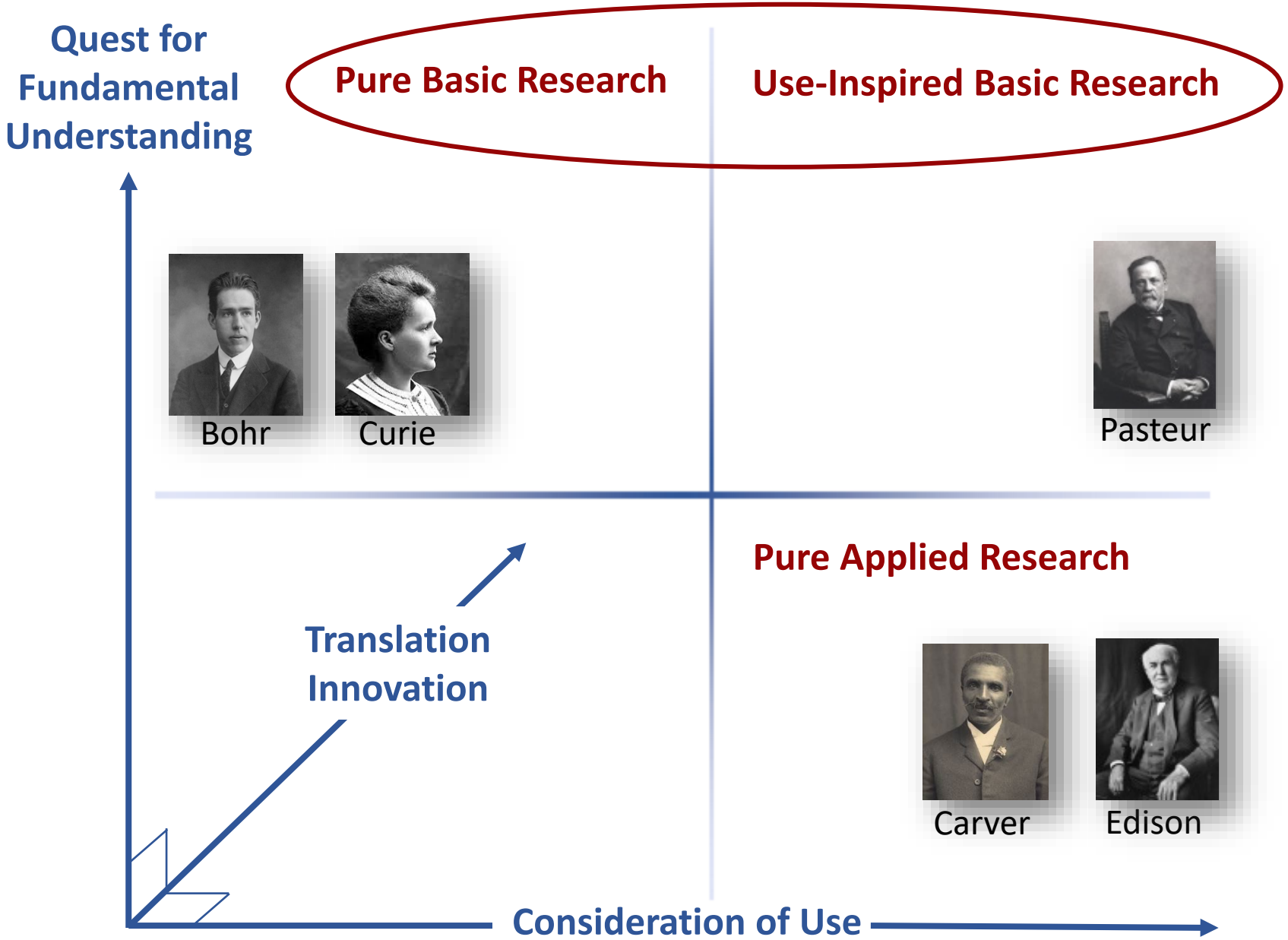
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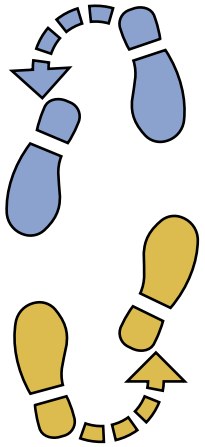

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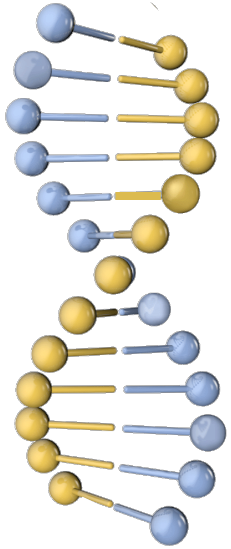
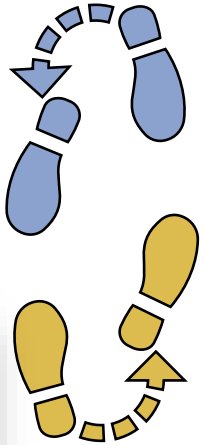
As NSF Grows and Evolves

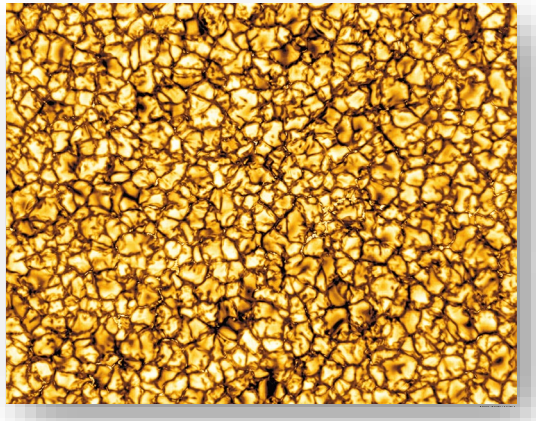
Discovery Research is central to the NSF mission

Working at the frontiers of knowledge





DKIST First Image

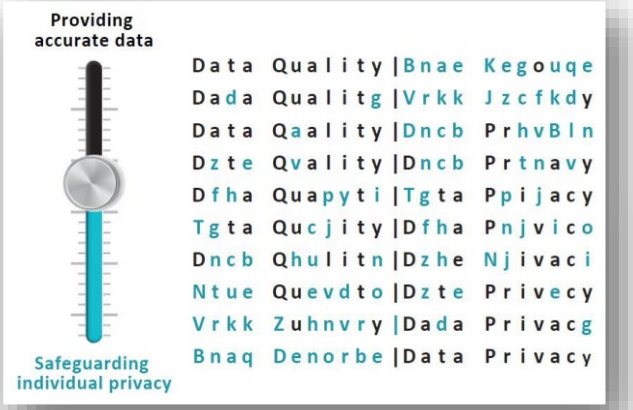


NSO/NSF/AURA

YlnMn Blue

M. A. Subramanian

Differential Privacy



Michael Hawes, US Census

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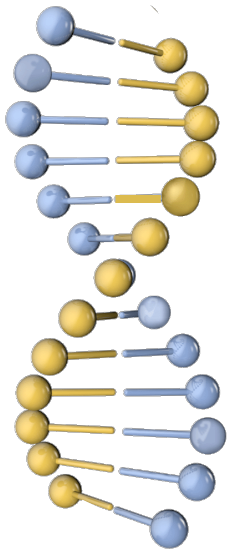

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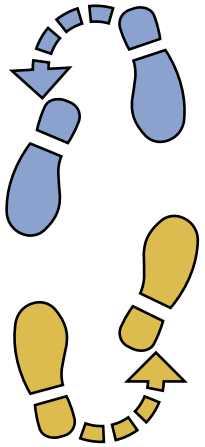
Working at the frontiers of knowledge

⚠ Beware of false dichotomies ⚠



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M. A. Subramanian

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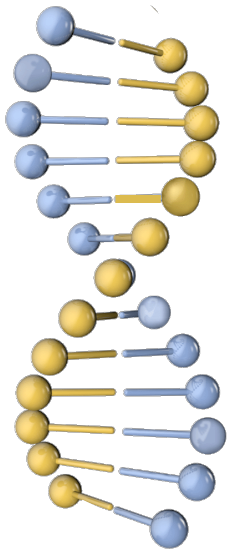

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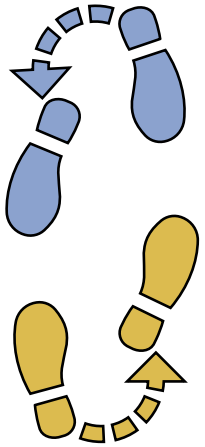

First new blue pigment in 200 years !

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Coloration Industry

An Embarrassment of Riches (Only a Few Examples)

Pure or Use-Inspired Basic Research	Translation and Innovation
Foundations of Electronic Marketplaces: Game Theory, Algorithms, and Systems	Algorithms for Kidney Exchange
Bacterial Immunity	CRISPR
Structural Biology, Computer Science, Physics, and Engineering (1980s)	Cryo-Electron Microscopy
Fundamental Research in Economics and Psychology	Behavioral Economics
Fundamental Research in Synthetic Biology (Directed Evolution)	Synthetic Pheromones, Pest Control

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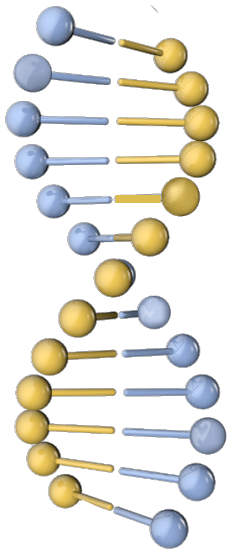
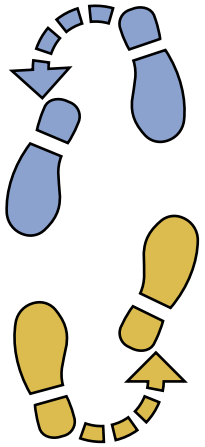
Enhancing the Basic Research Strand Further

Use the Flexibilities of NSF



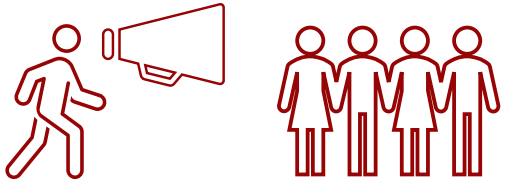


Capacity Building

Culture, People, and Risk Taking

Strategic Prioritization

Messaging a Range of Audiences



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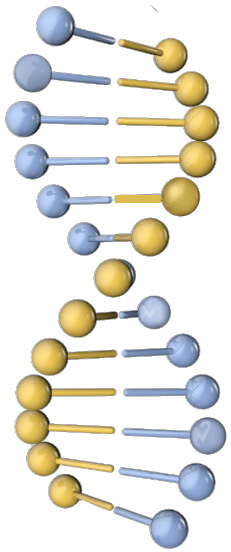

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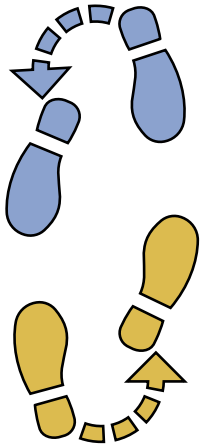

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Public, Research Community, Congress, White House, …