

# **DARPA 102: Working with Universities**

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Discover DSO Day

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## Department of Defense Directive

**SUBJECT** Department of Defense Advanced Research Projects Agency

**I. PURPOSE**

The purpose of this directive is to provide within the Department of Defense an agency for the direction and performance of certain advanced research and development projects.

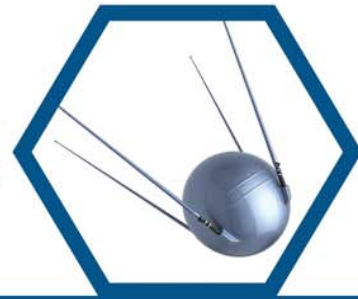
**B. Responsibility**

The Agency shall be responsible for the direction or performance of such advanced projects in the field of research and development as the Secretary of Defense shall, from time to time, designate by individual project or by category.



Through the Decades...

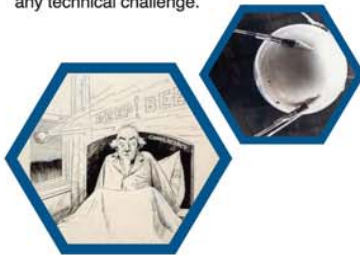
# Sputnik and the Birth of DARPA



1950s

## The Beep Heard 'round the World

The 1950s were marked by both the fervor of the Cold War and a belief that American ingenuity and industry could overcome any technical challenge.



Cultural Context

1957

## Sputnik and the Dawn of the Space Age

Everything changed on October 4, 1957, when the Soviets successfully launched Sputnik I. The world's first artificial satellite was no bigger than a beach ball, and took about 96 minutes to orbit the Earth. Though Sputnik was small in size, its launch caught the American public off guard. If the Soviets could put a satellite into space, what would stop them from putting a nuclear warhead into space next? The space race was on!



1958 Peace sign

1958  
Cassette tape



1959  
Buddy Holly dies



1959  
Cuban rebels take control of Havana



1958

## Success!

The new agency didn't waste time. ARPA's initial focus was on space, and on December 19, 1958, the agency achieved one of its earliest successes when President Eisenhower used the world's first communication satellite to address the nation.

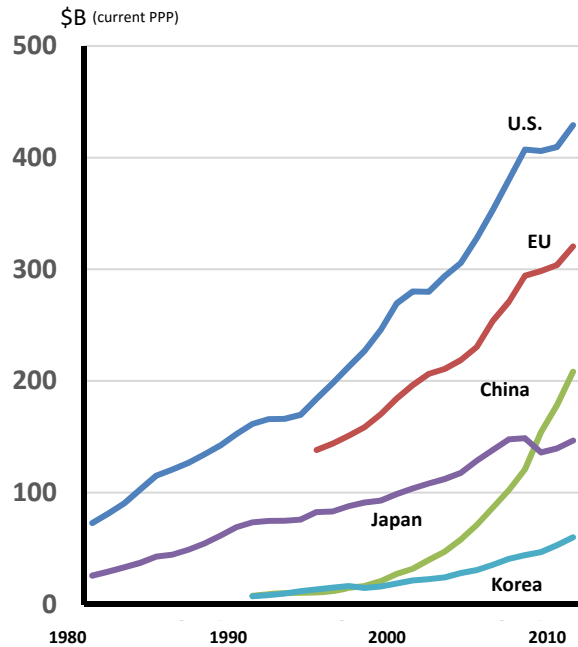
*"This is the President of the United States speaking. Through the marvels of scientific advance, my voice is coming to you from a satellite traveling in outer space. My message is a simple one: Through this unique means I convey to you and all mankind, America's wish for peace on Earth and good will toward men everywhere."*

— President Dwight Eisenhower

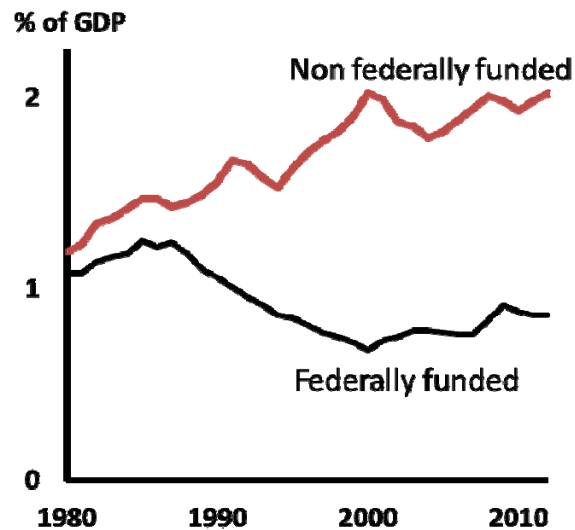




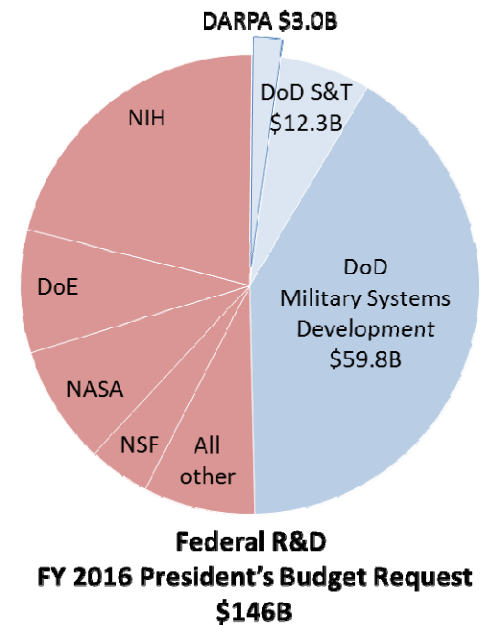
# R&D Expenditures



Global



National



Federal



## How We Think: The Heilmeier Catechism



Important questions to consider when approaching DARPA with ideas:

- What are we trying to do? (no jargon!)
- How does this get done at present?
- What is new about your approach?
- If we succeed, what difference do we think it will make?
- How long do we think it will take?
- Can we transition (to the DoD or others)?
- How much will it cost?



## Characteristics of a DARPA Program



- Revolutionary ideas that may lead to new national security capabilities (not extensions or incremental gains)
- Initiated on ideas articulated to the Director by Program Managers
- Project centric – not investigator centric
- Multi-year research portfolios to encourage “diverse” teams
- Flexible, rapid review and contracting
- Actively managed by the Program Manager
- Driven by quantitative technical goals and milestones
- Programs start quickly and END—having an on-going program in a domain does not imply we will continue to invest in that area
- “Old problems” CAN be revisited if there is a compelling reason, e.g., if a technological breakthroughs or great ideas have emerged
- We are looking for focus, commitment and dogged persistence in our performers; and a willingness to take on DARPA-worthy problems



## Things Universities Should Know



- Understand the DARPA Offices
- Understand role of the Program Manager
- Plan your visit (Researchers ♥ Arlington)
- Interact with DARPA
- Go beyond state-of-the-art
- Share ideas, don't sell ideas; listen to our problems/ideas
- Teaming
- 6.1 or 6.2
- Publications
- Students
- Security and foreign nationals
- Program scale, project sizes, budget considerations



## Things Universities Should Know



- You work for the Program Manager
- It will be assumed that DARPA comes first for you
- Program review meetings
- Travel
- Project tempo and timelines
- Things change
- We are part of the Department of Defense and have a specific mission
- In working with us, you are committing to this mission
- And, yes, we are trying to change the world



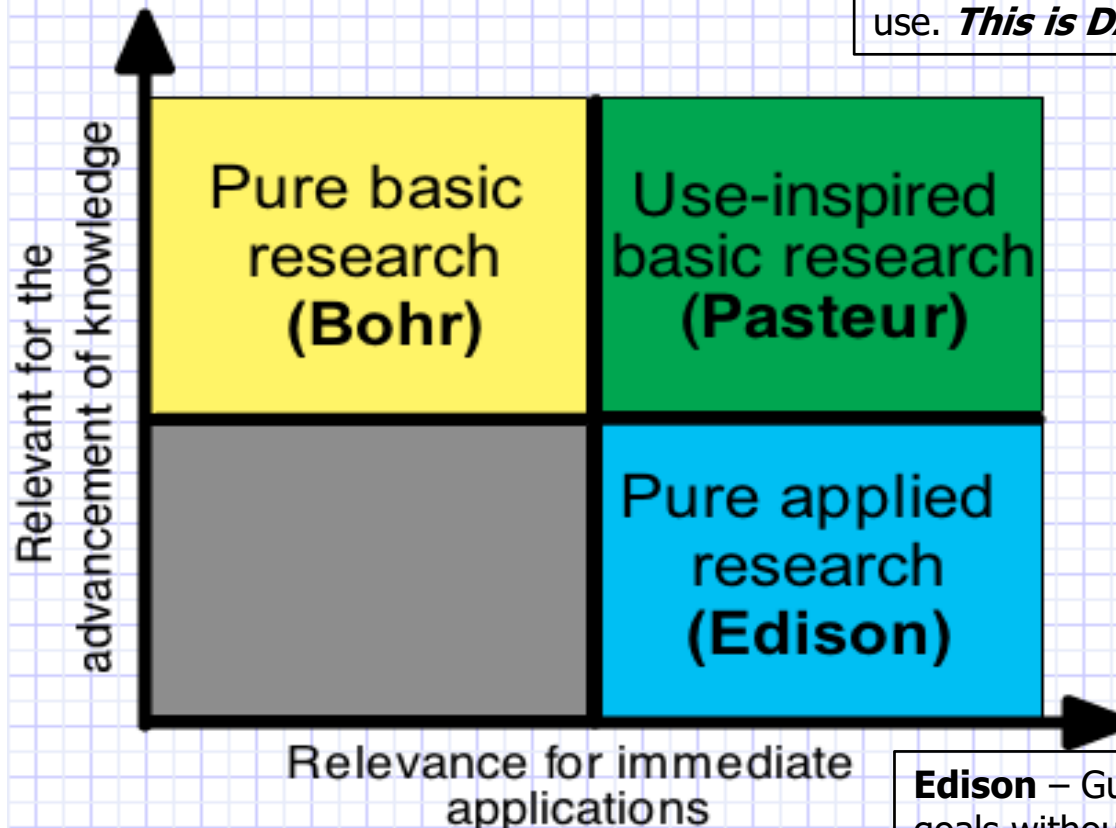


# Pasteur's Quadrant: DARPA's Power Lane



**Bohr** – Guided solely by the quest for understanding without thought of practical use.

**Pasteur** – Includes Basic Research that seeks to explain the frontiers of understanding, but is also inspired by considerations of use. ***This is DARPA.***



**Edison** – Guided solely by applied goals without seeking a more general understanding of the phenomena of a scientific field.



*Pasteur's Quadrant, Basic Science and Technological Innovation, Donald E. Stokes, 1997*



# Three Ways to Engage with DSO

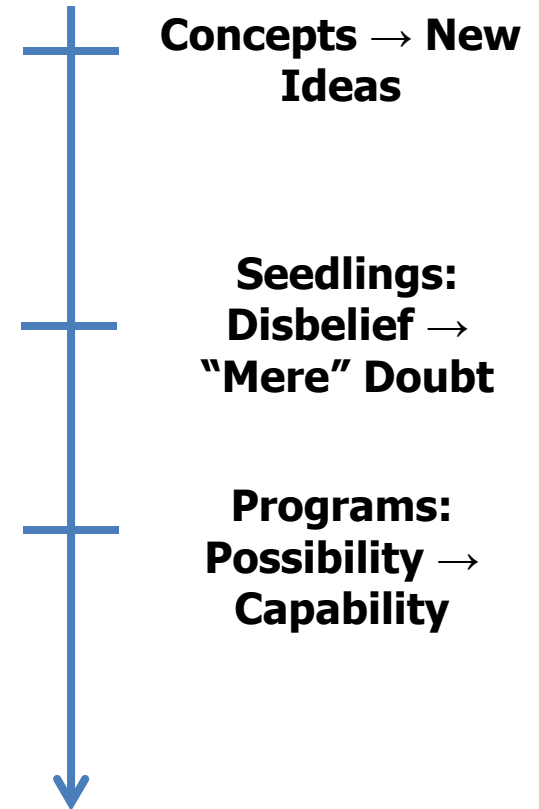


Talk to a Program Manager (PM)

- PMs here today and tomorrow
- Email/phone/face to face throughout the year

Submit ideas to the DSO Office-Wide BAA  
(HR001117S0040)

Respond to DSO program BAAs



Find DARPA announcements at [www.darpa.mil](http://www.darpa.mil), [www.fedbizopps.gov](http://www.fedbizopps.gov)  
and [www.grants.gov](http://www.grants.gov)

