

## Resources

Value of Basic Research

Re-thinking the Basic-Applied Dichotomy

National Policy on Sharing Basic Research

Analysis of the U.S. R&D budget over time shows that defense needs and political forces drive R&D expenditures. U.S. spending rises with defense costs -- conflicts or equipment upgrades -- and falls with decreasing threats or attempts to balance the budget, while Basic Research spending remains relatively stable and relatively small at < 1% of the DoD budget. Are we due for a rise? A better question is:

### How can we influence where the DoD budget in Basic Research is spent?

Consider the examples of successful defense technologies shown below, over the graph of federal and defense R&D spending. The timespan between Basic Research advances and its applications is long.

Therefore, we need to emphasize what fundamental advances Basic Researchers are making so that others can imagine the benefits. For example, what's possible with: *Advanced (atomic) clock technology that won't lose or gain a second in 15 billion years?*

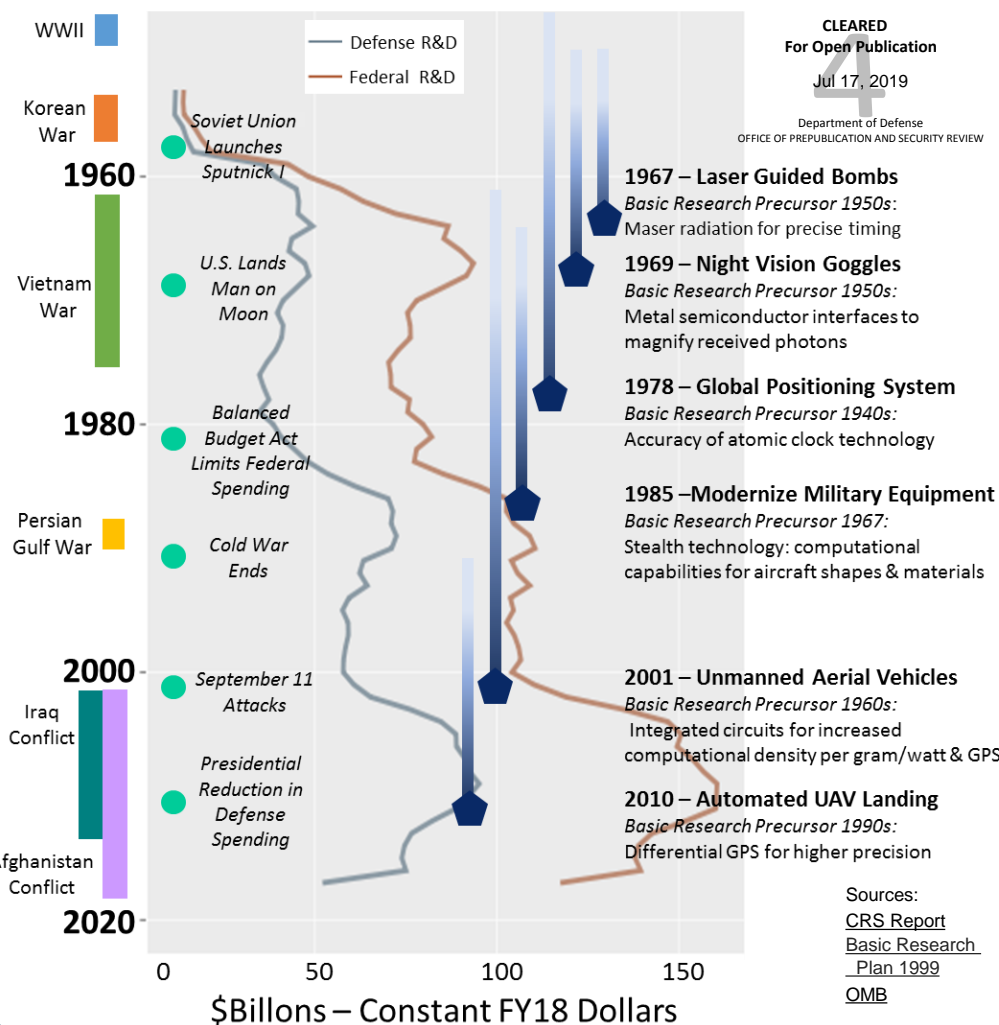
*An integrated circuit designed thousands of times smaller and lighter than its predecessors?*

We also need to regularly remind Congress of Basic Research advances because of the long time to application.

Basic Research may thrive best when left alone to do "good things". However, research that can be related to future Defense needs (based on Bush Fellow Research Study Team input!) has a higher chance of support.

## Trends in R&D Over Time

History - U.S. Spending - Technological Advances



**YouTube Recommendation**  
The atomic clock could arguably be the most visible use of atomic physics and lasers. Check out this [YouTube video](#) on the evolution of the atomic clock and the advancements enabled by precise timing.