

# **The OPNAV Perspective on Science, Technology, and Engineering: Opportunities and Obligations**

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# What Science and Technology Means to OPNAV: An Opportunity

## Game Changing Technology

- Railgun, LDUUV, Directed Energy

### Continuous Improvement For Current Product Lines

- FNCs, ManTech, TIPS
- prototypes and technology improvements
- informed options for acquisition: even “failed transitions” represent progress

### A Reserve Capacity to “Surge” S&T in Response to Emergent Threats and Opportunities

- Speed to Fleet, Swamp Works, Tech Solutions

### A Hedge Against An Uncertain Future

- A Broad Based Portfolio of Basic Science



## Affordable Asymmetric Advantages *Not an oxymoron*

### *EM Railgun*

- Multi-use weapon at \$25K per round ...



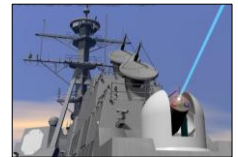
### *LDUUV*

- ISR at a fraction of the cost of an SSN



### *Solid State Laser*

- Less than \$1 per “shot”



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## Future Naval Capabilities Pillars

**Sea Shield** - Missile defense, ASW, MCM and fleet/force protection technologies

**Sea Strike** - Weapons, aircraft, and expeditionary warfare technologies

**Sea Basing** - Logistics, shipping, and at-sea transfer technologies

**FORCEnet** - C4ISR, networking, navigation, decision support and space technologies

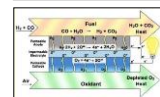
**Naval Expeditionary Maneuver Warfare** - Enhance the warfighting capabilities of naval ground forces with special emphasis on regular and irregular warfare

**Capable Manpower** - Match Sailors and Marines to the right jobs, design intuitive systems, and train for mission essential competencies

**Force Health Protection** - Protect Sailors and Marines by reducing morbidity and mortality when casualties occur

**Enterprise and Platform Enablers** - Cross-cutting technologies to lower acquisition, operations, and maintenance costs

**Power & Energy** - Energy security, efficient power and energy systems, high energy and pulse power



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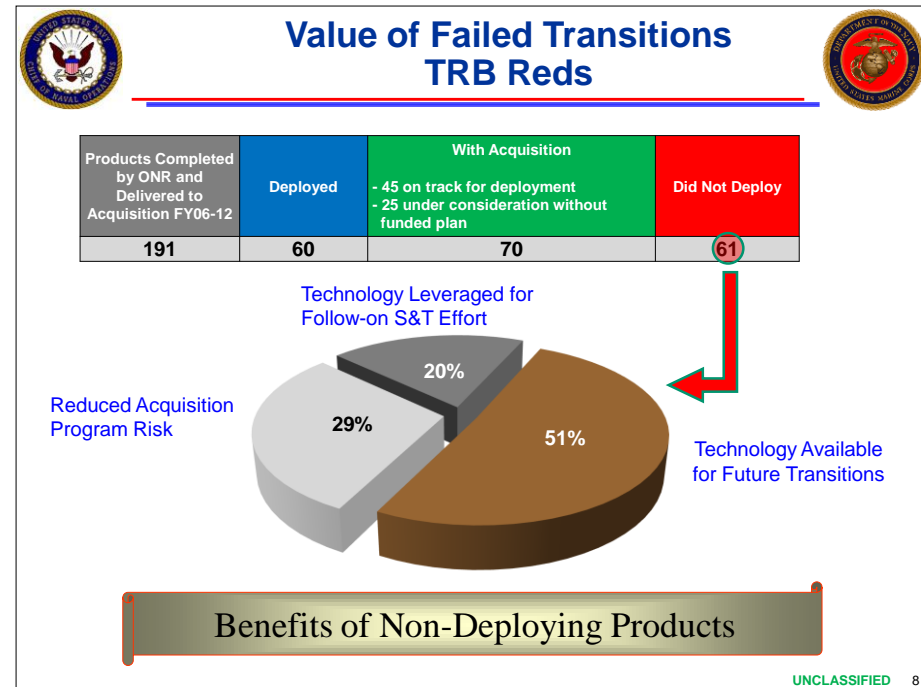
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## Quick Reaction S&T

### *Off-the-shelf technology projects with a 12 to 24 month time horizon*

- **SwampWorks:**
  - Newly invented/discovered technologies
  - Accelerated timeframe.
- **TechSolutions:**
  - Operational problems ID'd by Sailors and Marines
- **Speed to Fleet (S2F):**
  - high priority, near-term needs of warfighters
  - CNO funded, ONR/N84 managed



The Persistent Littoral Undersea Surveillance (PLUS) system was accelerated to operational use via S2F

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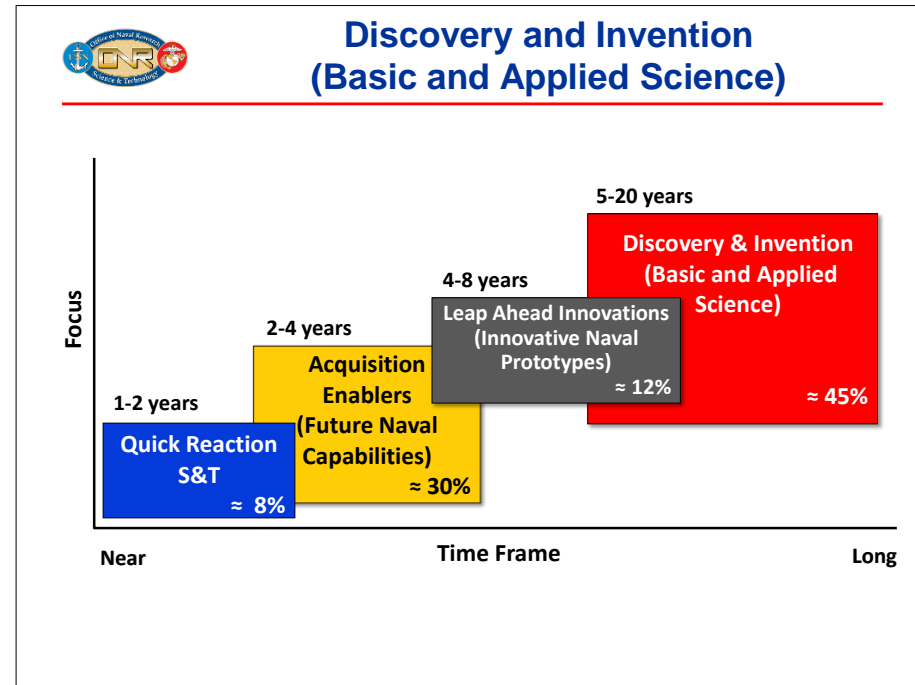
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## A Hedge Against An Uncertain Future

- **A Broad Based Portfolio of Basic Science**
- **The Foundation for Advanced Technology**
- **Mitigating Against Tech Surprise**
- **Seed Corn for Imposing Our Own Surprises**



# The Flip Side of Opportunity.....

OPNAV Operates at the Intersection of Fiscal Stress and Strategic Uncertainty  
Under These Conditions, “Opportunity” Can Feel More Like.....

.....A Bill.....



# The Flip Side of Opportunity.....

OPNAV Operates at the Intersection of Fiscal Stress and Strategic Uncertainty  
Under These Conditions, “Opportunity” Can Feel More Like.....

.....or A Treasure Chest to Be Raided

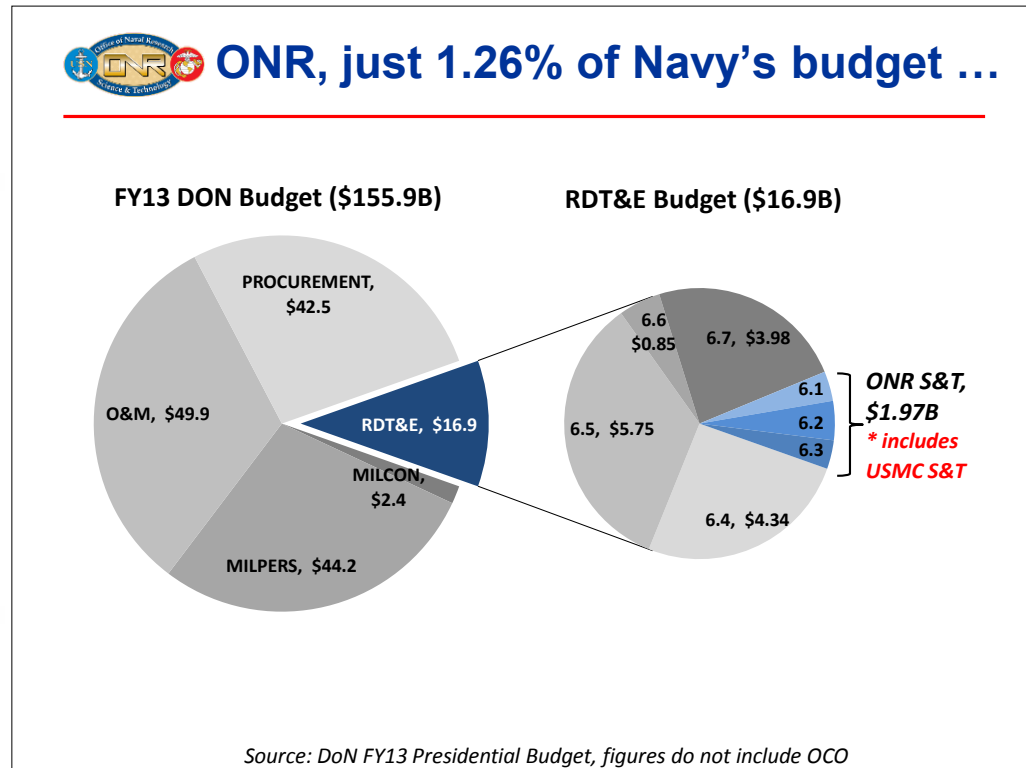




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....“if only I had that next marginal dollar...then I’d be whole....”



# The Flip Side of Opportunity.....

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Under These Conditions, “Opportunity” Can Feel More Like.....

.....or A Disruption....



# The Flip Side of Opportunity.....

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...there’s a reason it’s called Disruptive Innovation.....



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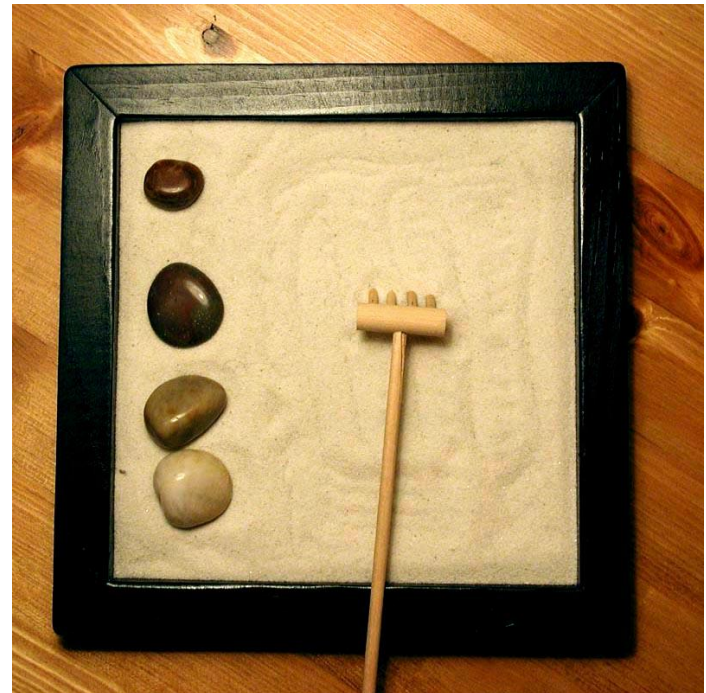
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“.... our POM is in ruins.....”



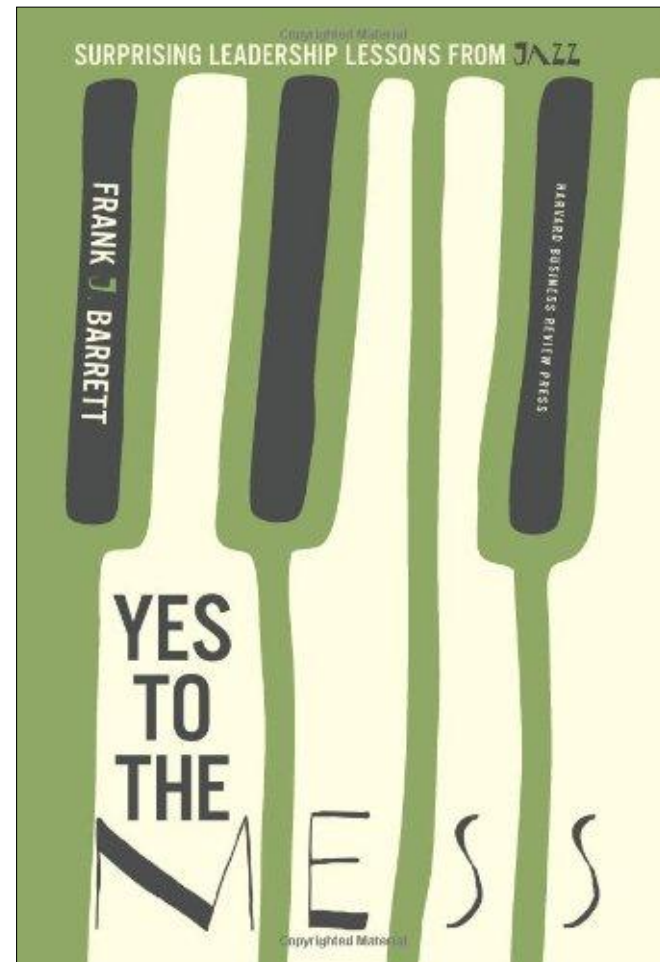
# The Flip Side of Opportunity Is Obligation

- What Science and Technology Means to OPNAV: An Obligation
- An Opportunity Without A Matching Obligation is Meaningless
- An Opportunity Without A Matching Obligation Distorts the Opportunity
- **Our First Obligation: Embrace Disruption....Engage In The Process**  
.....while our POM build may never go from this to this.....



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- An Opportunity Without A Matching Obligation is Meaningless
- An Opportunity Without A Matching Obligation Distorts the Opportunity
- **Our First Obligation: Embrace Disruption....Engage In The (Messy) Process**  
.....we can at least aspire to this.....



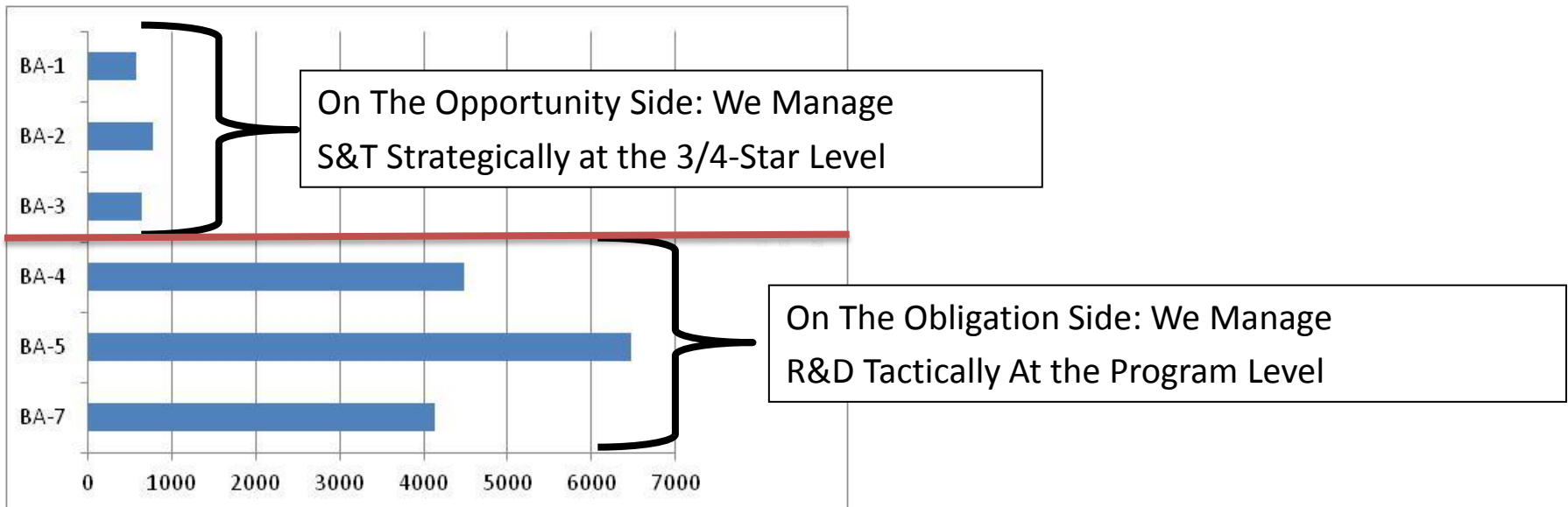
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- **Our Next Obligation: Examine Our Own Technology Development Practices**
  - CNO is Pressing On Many Fronts: Improve Our Innovation OODA Loop
  - Until Now The Primary Focus Has Been On the S&T Side of that Equation
  - While S&T Can Always Continue To Be Improved.....
  - The Next Great Opportunity for Improvement Lies With Us.....

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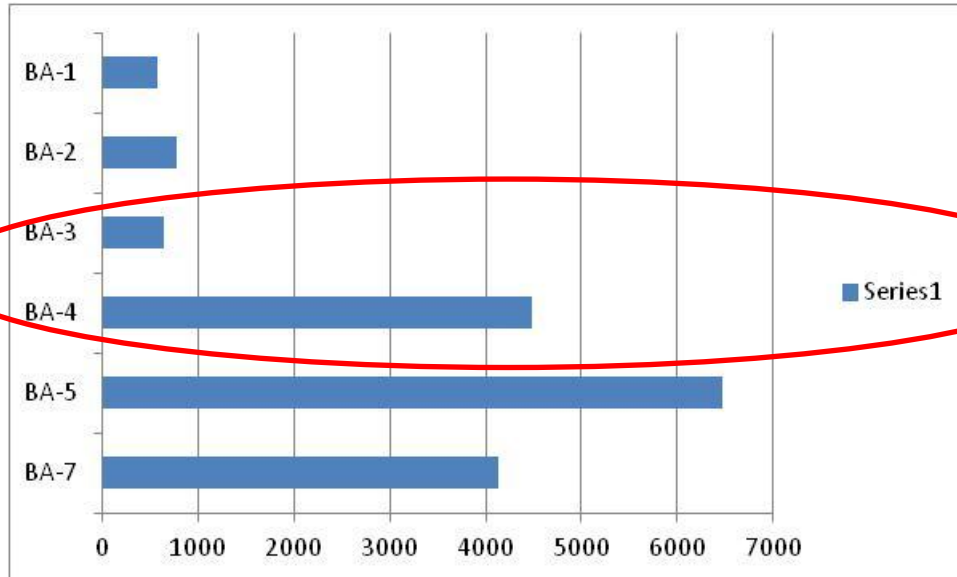
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## Where We Are Today: To Improve Innovation Focusing On S&T Is Necessary But Insufficient





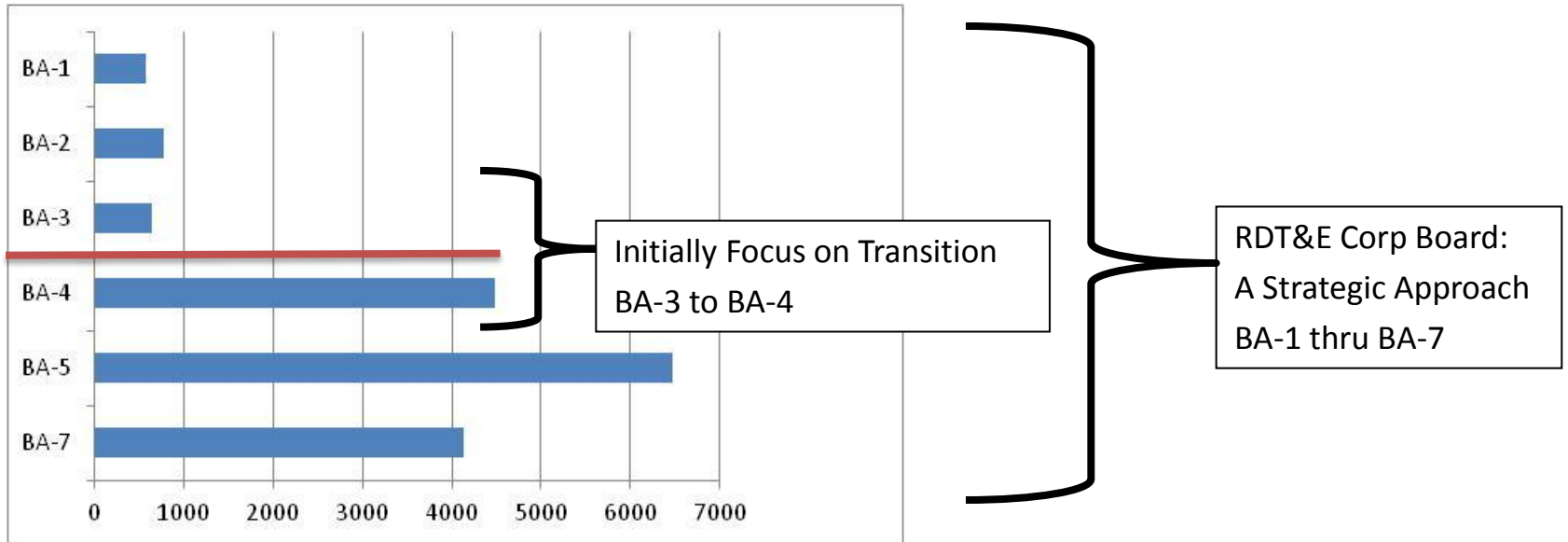
# True or False? The Valley Of Death Is Caused by a Lack of BA-4 Funding



is this a Valley of Death?  
or a Darwinian Sea?

is the Valley of Death a fait accompli?  
or an artifact of how we manage R&D?

# Where We're Headed/Signs of Progress



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- An Opportunity Without A Matching Obligation is Meaningless
- An Opportunity Without A Matching Obligation Distorts the Opportunity
- **Our Final Obligation: Make Peace With the Non-Linear Nature of S&T**
  - While each of these are now hailed as a success, their individual journeys in real time were full of twists, turns, and unexpected obstacles and opportunities along the way



*Every new leap in the Navy's warfighting capabilities started with Navy research:*

- GPS
- E2-D radar
- Towed array
- Aegis
- Quiet propulsion
- Directed energy ...



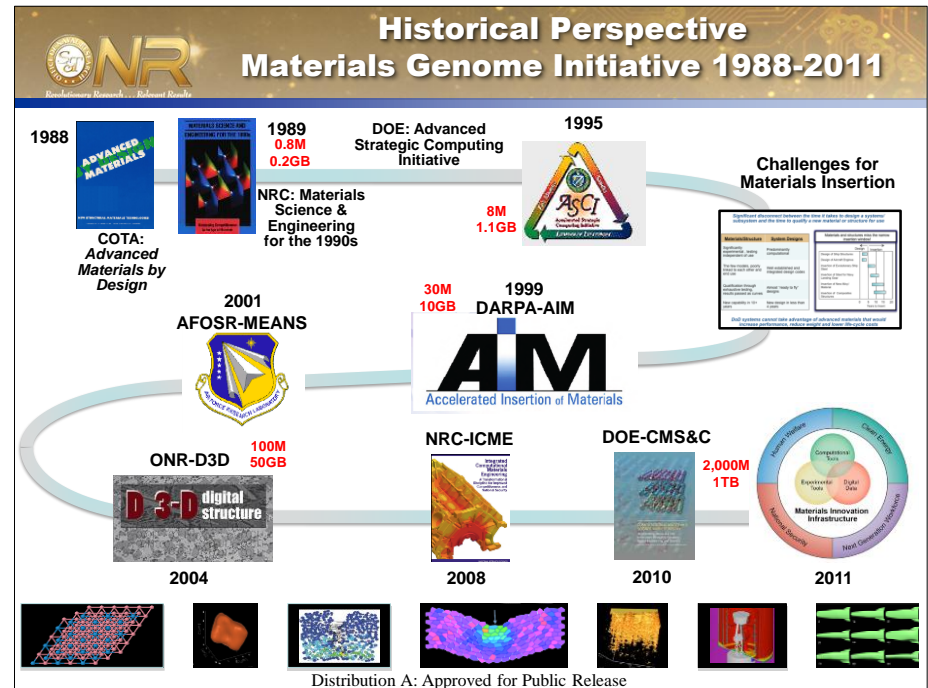
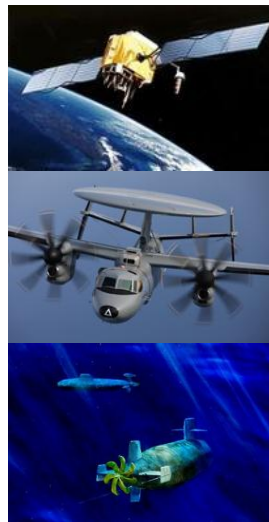
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**Questions?**

**Comments?**