



National Academy of Sciences
Fall Meeting of the Board on Physics and Astronomy

ONR Overview and the Naval S&T Strategy

Dr. Tom Fu, Executive Director
Office of Naval Research

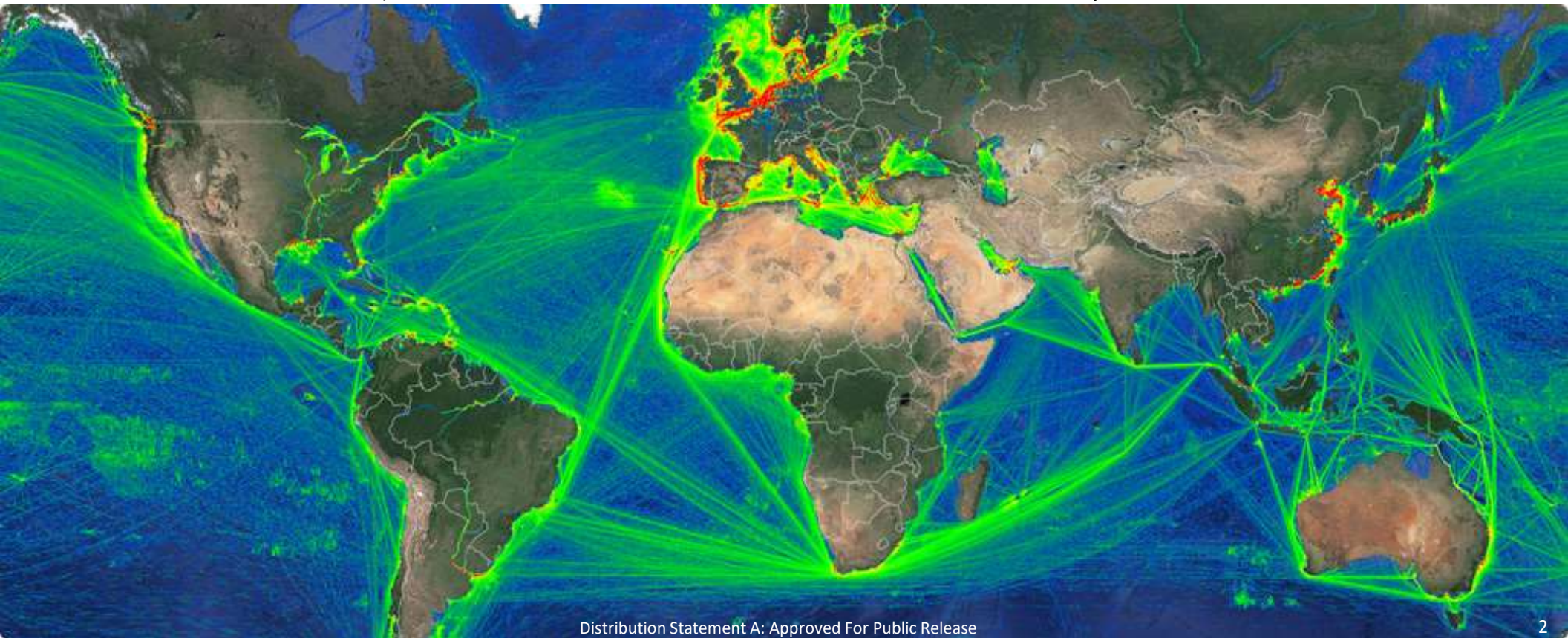
November 22, 2024

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We are a Water World

- ~**70%** of the world is covered in water,
- ~ **80%** of the population lives within a few hundred miles of an ocean coast,
- ~ **90%** of global commerce travels by ship
- over **99%** of intercontinental communications (including financial transactions) travel via an underwater cable.



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U.S. Navy

Who We Are. We are the United States Navy, the most powerful navy in the world. We are the Sailors and Civilians who have answered our Nation's call to service. We are Americans who embody character, competence, and dedication to our mission. Our identity is forged by the sea, and we serve with **honor, courage, and commitment.**

What We Do. We are here to **preserve the peace, respond in crisis, and win decisively in war.** We operate far forward, around the world and around the clock, from seabed to space, in cyberspace, and in the information environment to promote our Nation's prosperity and security, deter aggression, and provide options to our nation's leaders. We deliver **power for peace** but are **always postured and ready** to fight and win as part of the Joint Force and alongside our Allies and partners.

AMERICA'S WARFIGHTING NAVY

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Who We Are Doing. The threats to our nation and our interests are real and growing. The strategic environment has changed: gone are the days of operating from a maritime sanctuary against competitors who cannot threaten us. The National Defense Strategy makes clear that we must defend our homeland, deter strategic attack, deter and be prepared to prevail in conflict against the People's Republic of China, and meet the acute challenge of an aggressive Russia and other persistent threats. Our adversaries have designed their militaries to overcome our traditional sources of strength. We must meet rapidly to stay ahead and continuously create warfighting advantages. We must think, act, and operate differently, leveraging warfare, and experimentation to integrate conventional capability with hybrid, unmanned, and disruptive technologies. Tomorrow's battlefield will be incredibly challenging and complex. To win decisively in that environment, our Sailors must be the best warfighters in the world with the best systems, weapons, and platforms to ensure we can defeat our adversaries. We will put more people in the field—platforms that are ready with the right capabilities, weapons and sustainment, and people who are ready with the right skills, tools, training, and mindset.

Our Priorities. We will focus on Warfighting, Warfighters, and the Foundation that supports them.

Warfighting: Deliver Decisive Combat Power. We will view everything we do through a warfighting lens to ensure our Navy remains the world's preeminent fighting force. We will prioritize the modernization and capabilities required to fight and win at sea, and the logistics and shore support required to keep our Navy fit to fight. We recognize that we will never fight alone. We will advance naval integration with the Marine Corps, and synchronize and align our warfighting efforts with the Joint Force. We will design and deliver interoperability with our Allies and partners to deliver combined lethality.

Warfighters: Strengthen the Navy Team. We will use the principles of mission command to empower leaders at all levels to operate in uncertain, complex, and rapidly changing environments, ready to take initiative and bold action with confidence. We will build strong warfighting teams, recruiting and retaining talented people from across the rich fabric of America. We will provide world-class training and education to our Sailors and Civilians, honing their skills and giving them every opportunity to succeed. We will ensure our quality of service meets the highest standards, and we will look after our families and support networks, who enable us to accomplish our warfighting mission.

Foundation: Build Trust, Align Resources, Be Ready. We will earn and reinforce the trust and confidence of the American People every day. We will work with Congress to field and maintain the world's most powerful Navy and the infrastructure that sustains it. We will team with industry and academia to solve our most pressing challenges. We will cooperate with the interagency to bolster integrated deterrence. We will align what we do ashore with the warfighting needs of our Fleet.

Our Change. America is counting on us to deter aggression, defend our national security interests, and preserve our way of life. With the right tools, a winning mindset, and the highest levels of integrity, we will operate safely as a team to deliver warfighting excellence. I am proud to serve alongside you. I thank you and your families for your continued commitment to ensuring we are always ready. We have taken a fix and set our course. Together we will deliver the Navy the Nation Needs. The time is now to move with purpose and urgency: **ALL AHEAD FLANK!**

Lisa M. Franchetti
LISA M. FRANCHETTI
Admiral, United States Navy
33rd Chief of Naval Operations

NAVY TODAY: CARRIERS

Updated: November 4, 2024



Ships Underway: 42 Deployed, 33 Non-Deployed, 75 Total (26%)

Personnel Forward Deployed by Fleet

4th FLT	5th FLT	6th FLT	7th FLT	Total
200	10,000	24,000	18,000	42,600



ONR Organization

*“To plan, foster and **encourage scientific research** in recognition of its paramount importance as related to the maintenance of **future naval power**.”*

— Public Law 588, 1 Aug 1946



KNOWLEDGE AND DISCOVERY
for the FLEET and FORCE DESIGN

CAPABILITY OPTIONS
for the FLEET and FORCE

NEW INDUSTRY PARTNERS and
NAVAL SCIENTIFIC DIPLOMACY

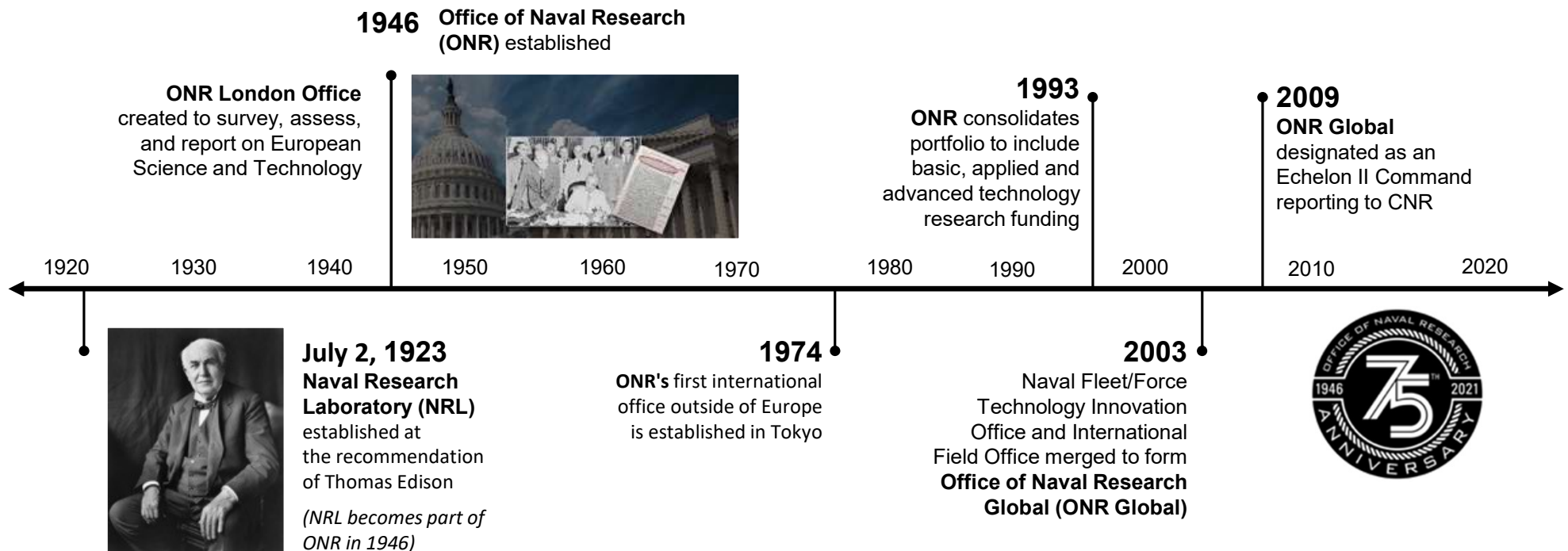


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ONR History and Mission

Naval Research Enterprise Organizational Milestones



NRL is headquartered in Washington, DC with four field sites in the U.S.



ONR is headquartered in Arlington, VA sponsoring facilities in the US and abroad.



ONR Global is headquartered in London with 19 locations over five continents.

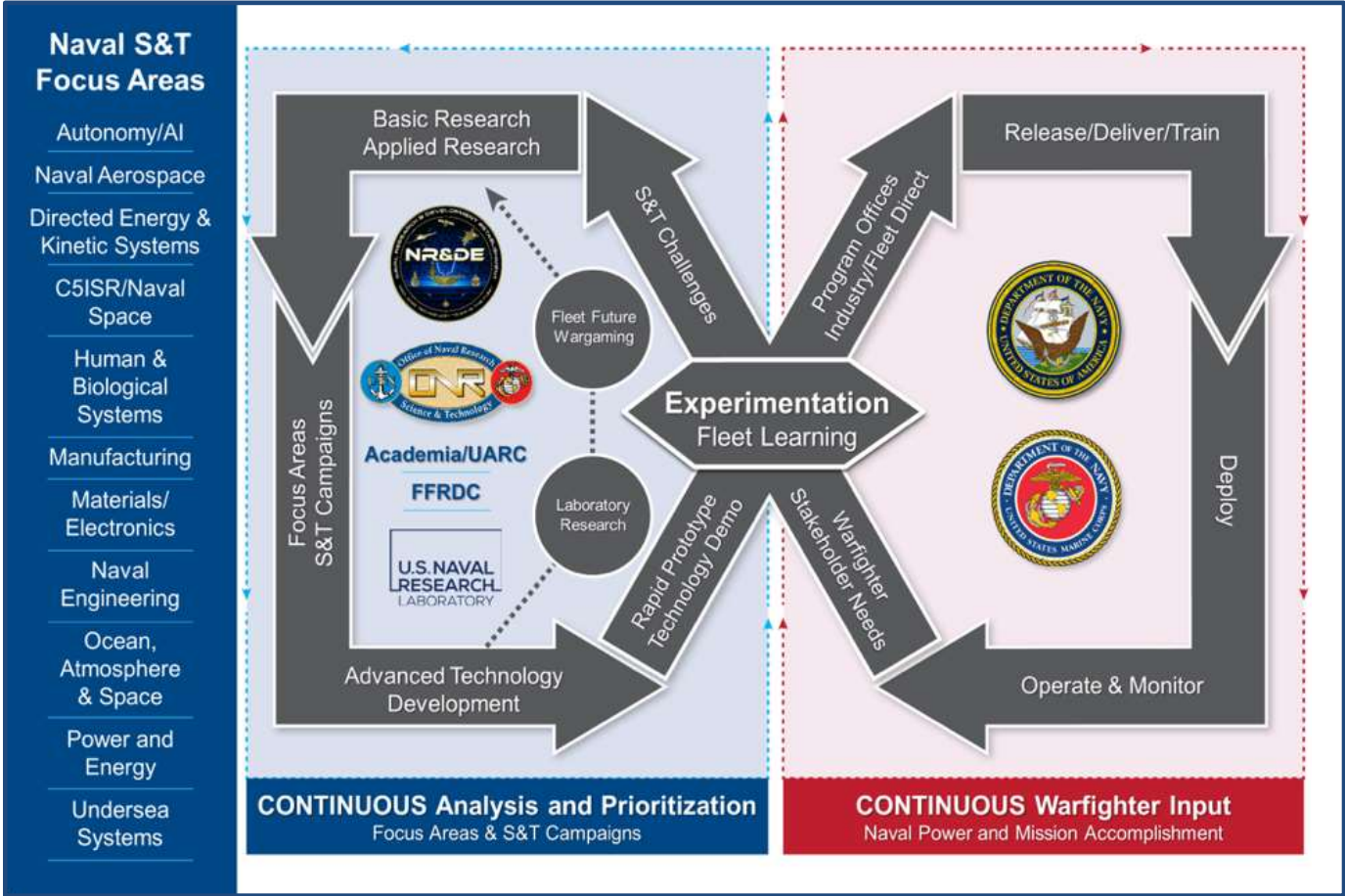
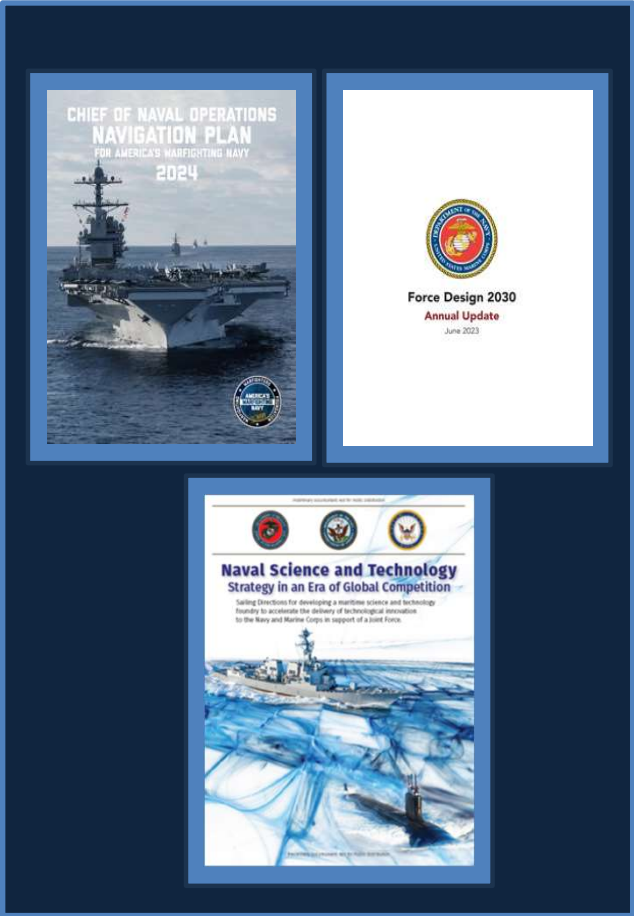


ONR Portfolio Perspective





Naval S&T Strategy





NAVWAR



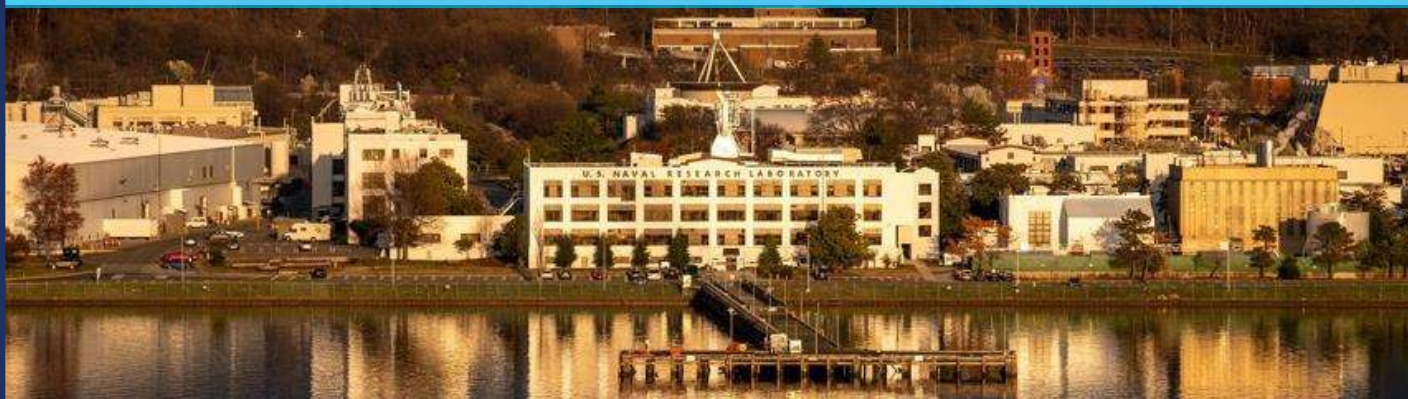
Directly Sponsored Work

Naval Research Laboratory



- Basic and Applied Research and Advanced Technology Development for Anticipated Navy and Marine Corps Needs
- The Navy's Corporate Laboratory
- World-Class Research Team

Delivering Warfighter Advantage >>>>



Integrated Research Portfolio



NRL Basic & Applied Research



Acoustics



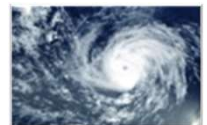
Remote Sensing



Oceanography



Marine Geosciences



Marine Meteorology



Space Science

NRL Research Focus Areas

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Office of Naval Research Global

MISSION

Obtain, coordinate & make available
worldwide scientific information



VISION

Be the partner of choice for
S&T leaders



Connecting 4000+ People

> 1000 Partners

Engagement in 58 Countries



Departments

INTERNATIONAL SCIENCE

INTERNATIONAL ENGAGEMENT

SCIENCE ADVISOR PROGRAM

EXPERIMENTATION AND ANALYSIS

FOREIGN COMPARATIVE TEST

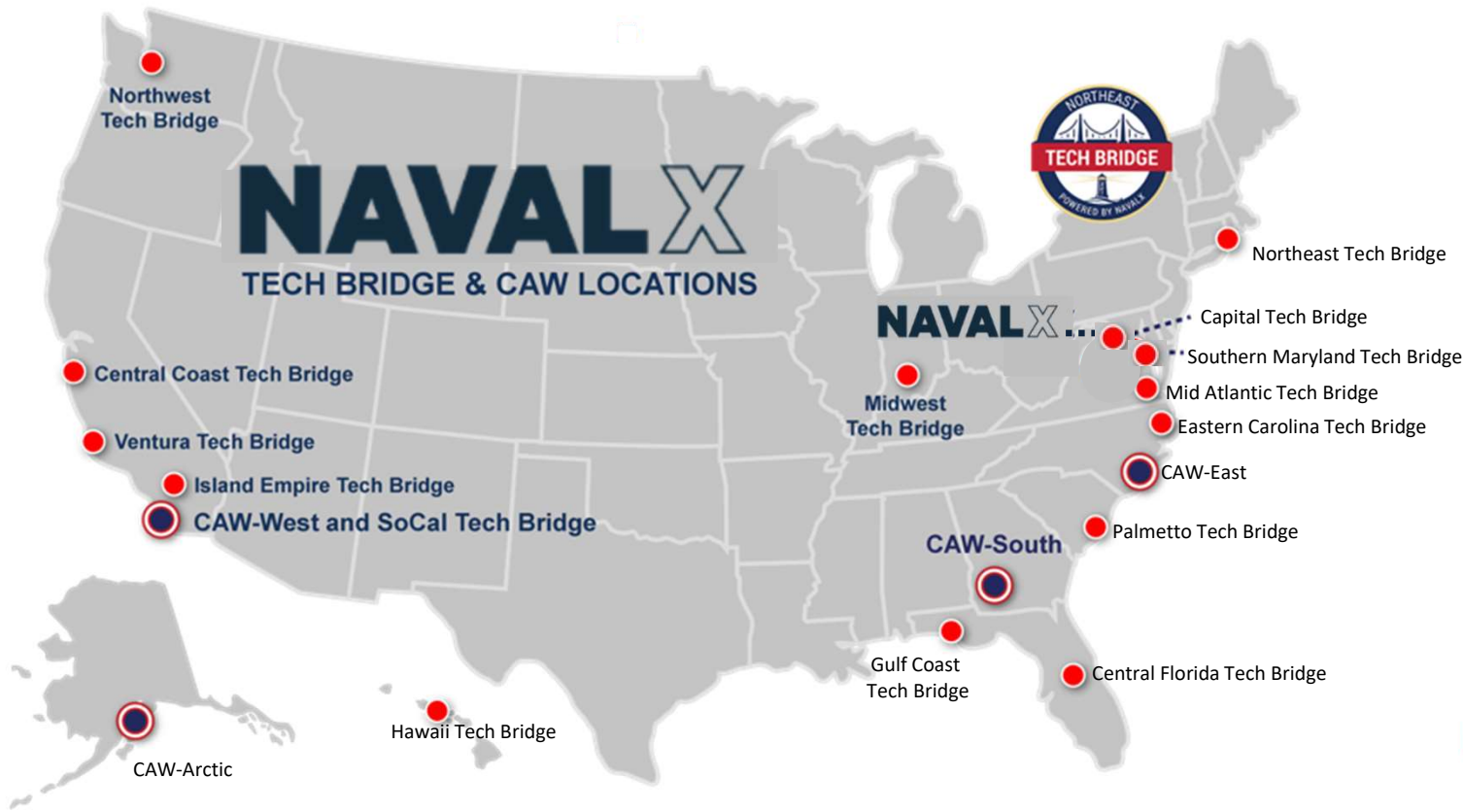
TECH SOLUTIONS



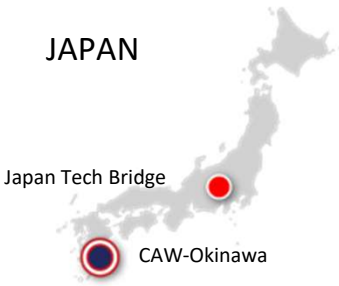
Building Partnerships

Connecting Experts & Solutions with Workforce Needs

Enabling a Responsive Collaborative Naval Network



JAPAN



UNITED KINGDOM

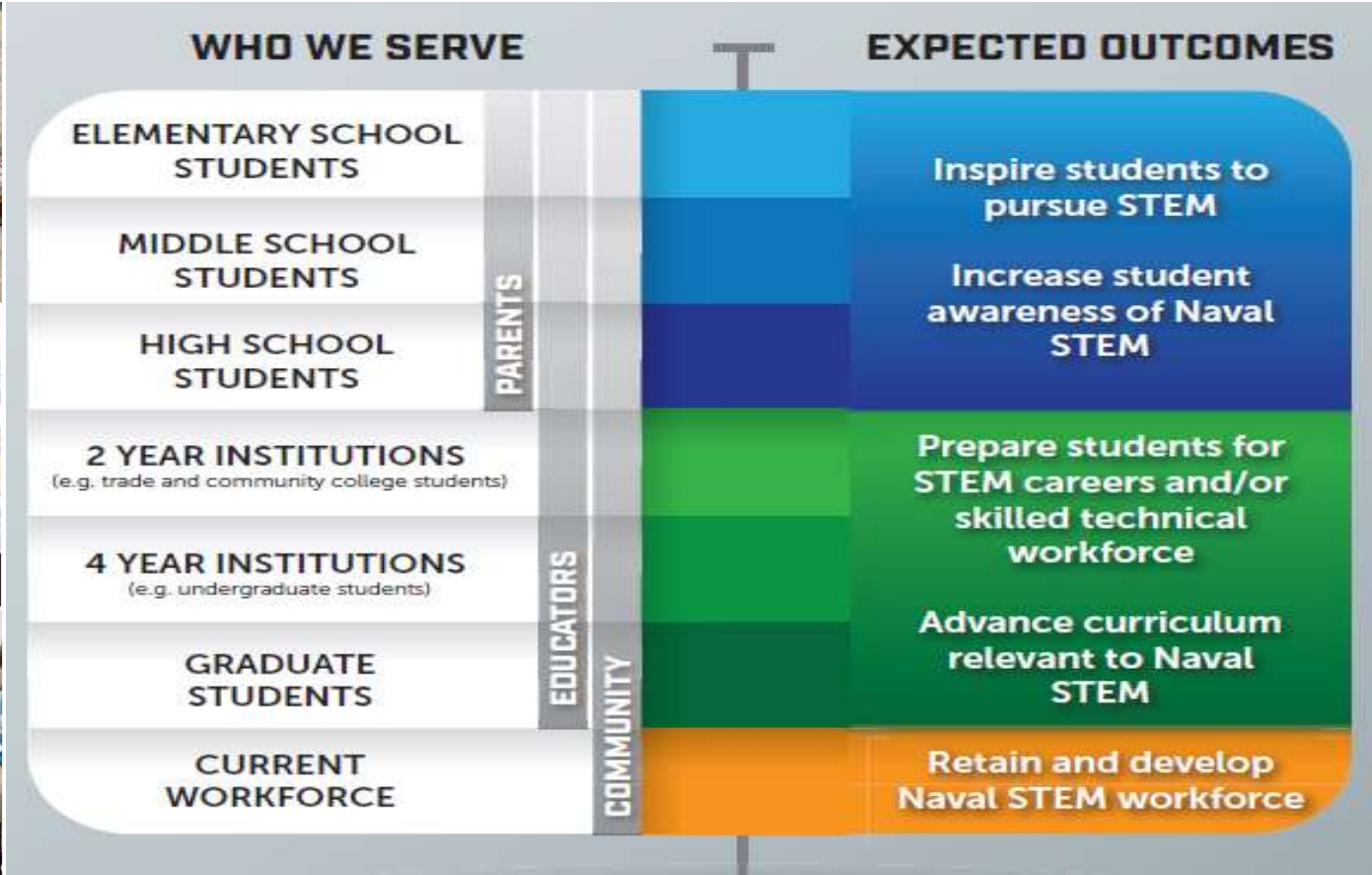
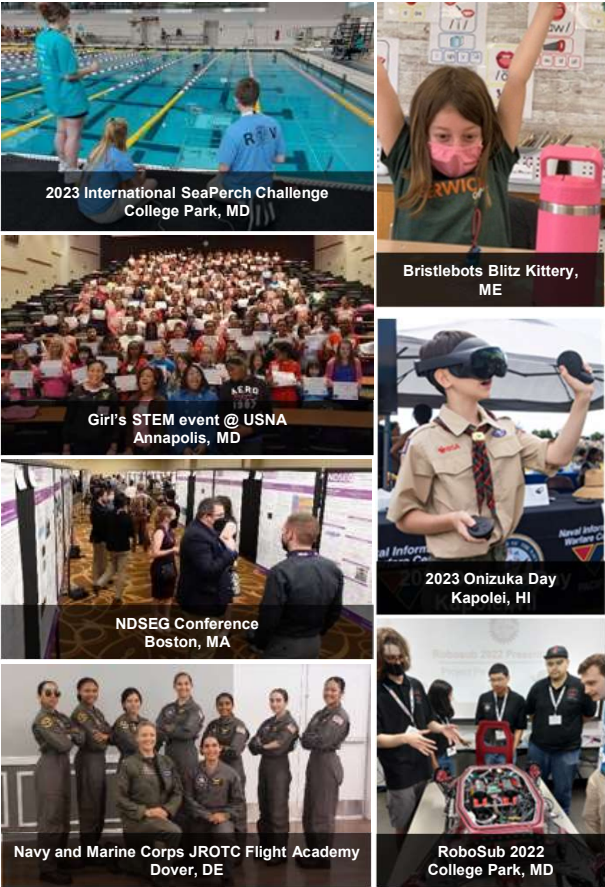


CAW = Centers for Adaptive Warfighting

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Naval STEM Outreach to over 300,000 Students Annually





Broadening Participation

The Key to Success

To maintain naval dominance, the future workforce must be the best-trained, most innovative and highly motivated in the world, and it must reflect American society. For this reason, targeting the enduring advantage of our research universities and supporting naval Science, Technology, Engineering and Math (STEM) throughout all phases of American students' academic development and investing in Historically Black Colleges and Universities (HBCU) and Minority Institutions (MI) are matters of national security.



*STEM education and outreach
opportunities for students from K-PhD
to the current workforce*



*Research opportunities for Historically Black
Colleges and Universities / Minority Institutions
to address naval research priorities*



Naval Research & Development Establishment (NR&DE)

The Naval Research Enterprise

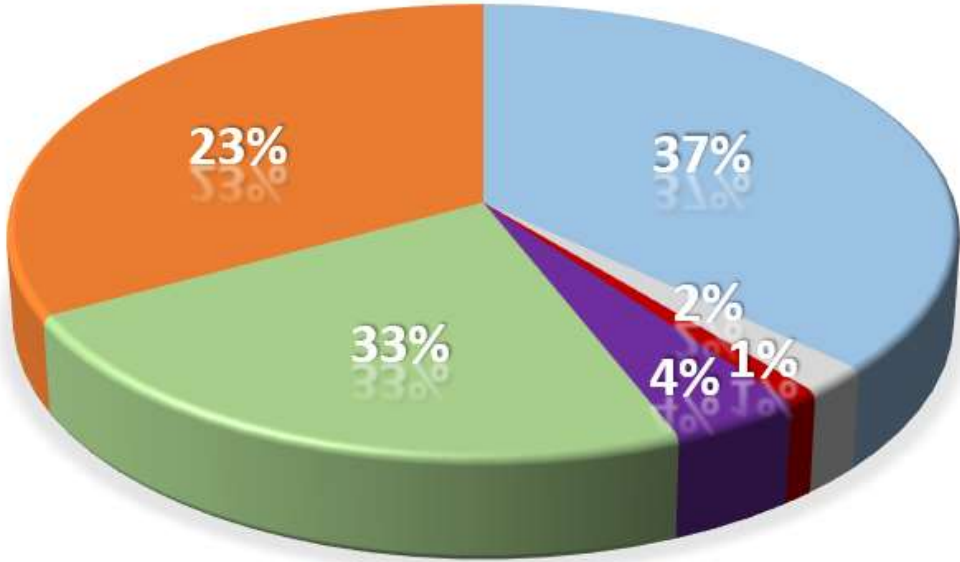




ONR Portfolio Investment



- 6.1 ● Basic Research
- 6.3 ● Advanced Technology Development
- 6.6 ● Management Support

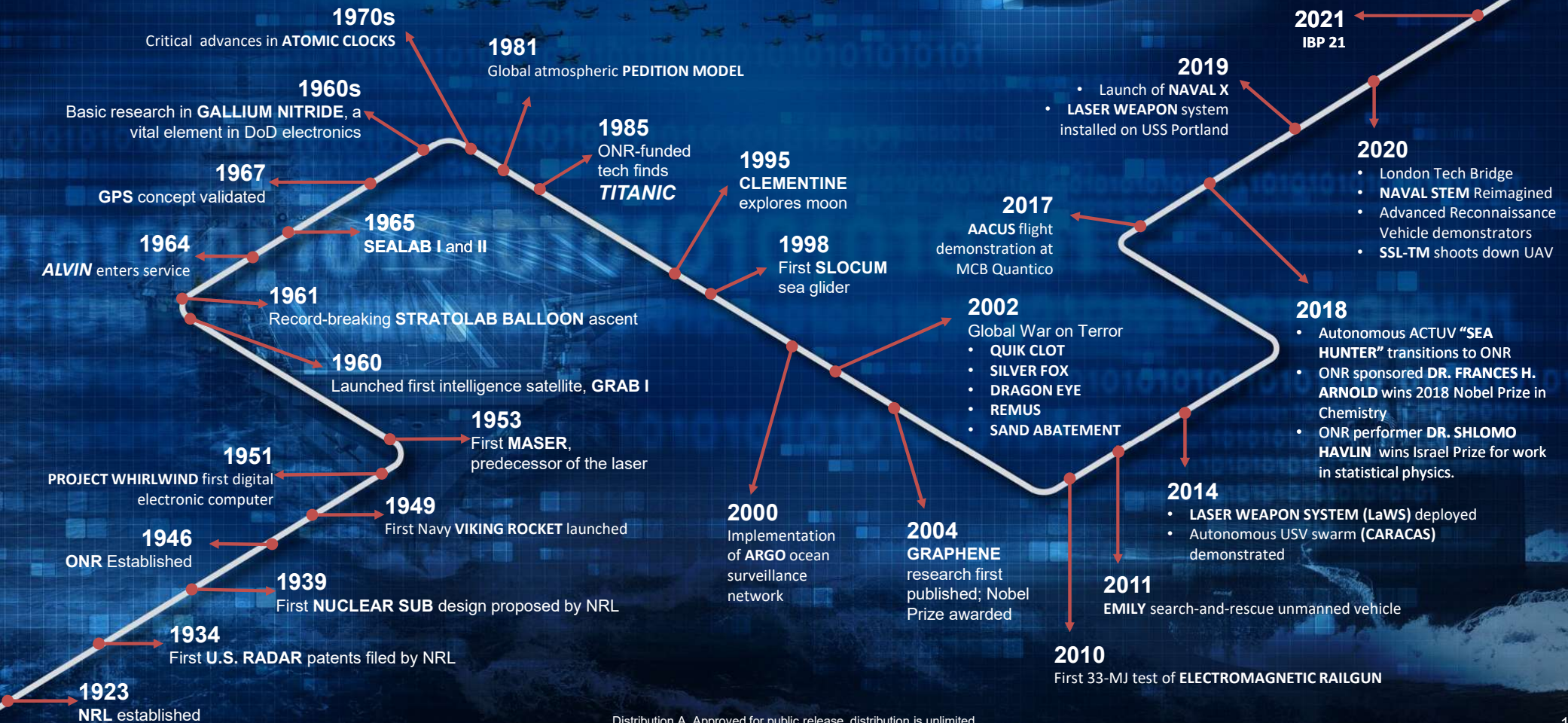


- 6.2 ● Applied Research
- 6.4 ● Advanced Component Development and Prototypes
- 6.7 ● Operational System Development



NRE Technology Timeline

Over 60 Nobel Prizes awarded to ONR-sponsored researchers since 1946



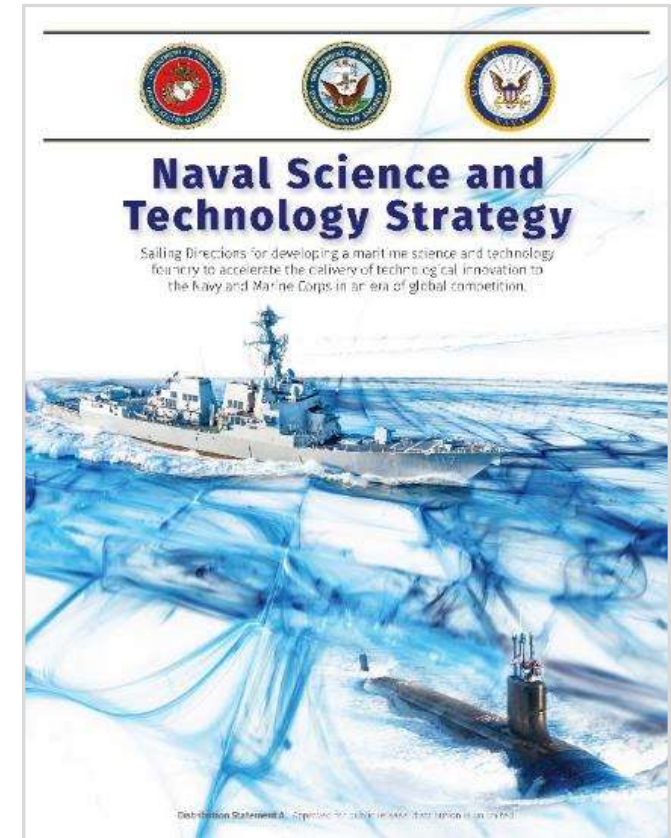
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Naval S&T Strategy

In line with SecNav Priorities for the Navy, the Naval S&T Strategy focuses on:

- ***Strengthening Maritime Dominance***
 - Realize Technology Gains Faster
 - Find Disruptors –updated *Decision Engine*
 - Play to Our Strengths
 - Experimentation and War Gaming
- ***Building a Culture of S&T Excellence***
 - Sailor, Marine, Scientist, and Engineer Teaming
 - S&T Tradecraft - *Partnering and Building Capacity*
 - NPS, USNA, NWC & STEM/HBCU-MI
- ***Enhancing Naval Scientific Diplomacy***
 - Partnerships at Home & Abroad
- ***Naval Warfare Alignment***
 - CNO NAVPLAN & Get Real Get Better Framework
 - Navy and USMC Force Design



[2024 NAVAL ST STRATEGY FINAL.PDF \(defense.gov\)](#)

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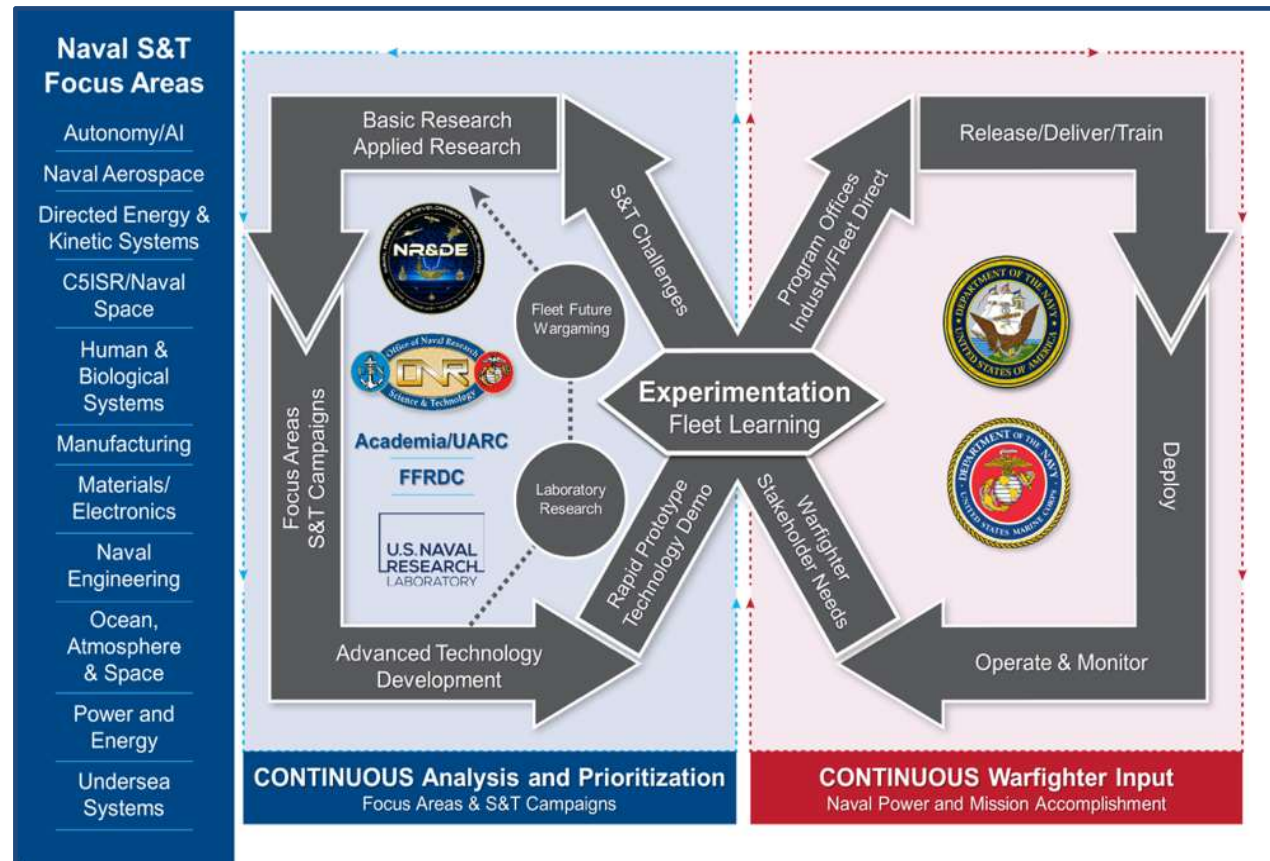


BA1 Metrics:

- 1,388 grants with 333 performers (\$263M in FY24)
- 299 Inter-Navy awards to 42 activities (\$65M in FY24)
- Recognition
 - 2024 - Two Nobel Prize winners (Hopfield in Physics, Baker in Chemistry)
 - 2022 - Three ONR researchers inducted into the National Academy, two were named VinFuture Female Innovators and another was elected to the Royal Society.
 - 2021 - Three Nobel Prize winners

BA2 Metrics:

- 686 grants to 252 institutions (\$162M in FY24)
- 688 Inter-Navy awards to 39 activities (\$146M in FY24)
- 123 contracts with 78 performers (\$81M in FY24)
- 94 Other-DoD awards to 25 activities (\$4M in FY24)
- 21 US Gov (non-DoD) awards to 13 agencies (\$9M in FY2)





Questions?