

# APL Identifies Two New Defining Innovations

*APL Staff Writers*

Among APL's thousands of critical contributions to national security and space exploration are a number of defining innovations: game-changing breakthroughs in technology that have created inflection points in history. These revolutionary advances have ignited new engineering accomplishments globally, saved lives, and secured the United States against threats at home and abroad.

At its 75th anniversary, APL named its first nine defining innovations:

1. Radio Proximity Fuze: APL's First Game-Changing Technology
2. APL: The Birthplace of U.S. Navy Surface-to-Air Missiles
3. Transit: The World's First Satellite-Based Global Navigation System
4. AMFAR: Pathway to Phased Array Radar
5. Exploiting Undersea Physics: Enabling Advanced Sonar Arrays
6. SATRACK: Transforming Ballistic Missile Testing
7. Tomahawk: The World's First Long-Range, Autonomous, Precision-Guided Weapon
8. Cooperative Engagement Capability: Networking Fleet Air Defenses
9. Discovery: Pioneering Low-Cost Planetary Exploration

On the occasion of its 80th anniversary, APL named two new defining innovations, its 10th and 11th. They

are described briefly below. Read about all of APL's defining innovations and download the posters at <https://www.jhuapl.edu/about/defining-innovations>.

## BALLISTIC MISSILE DEFENSE FROM THE SEA

APL responded to the critical challenge of proliferating ballistic missile threats, leading the development of the transformational system needed to demonstrate Ballistic Missile Defense (BMD) from the sea. The resulting experiments proved that BMD technology could be integrated with a Navy weapon system to "hit a bullet with a bullet" in space from the sea. APL's critical contributions opened the door for the Navy's central role in BMD. The resulting impact is felt far beyond our nation's shores as BMD now provides enduring defense at sea and ashore across the globe.

## PLANETARY DEFENSE

For more than a decade, APL engineers and scientists developed game-changing concepts and technologies to prove that it was possible to defend our planet from an asteroid on a potentially catastrophic Earth-impact trajectory. APL established the technological basis for planetary defense; solidified the domain as a research and development area at the federal level; played key roles in defining and exercising interagency and international coordination responsibilities; and captured worldwide attention by successfully completing the Double Asteroid Redirection Test (DART) mission, the first in-space demonstration of planetary defense technology.



## BALLISTIC MISSILE DEFENSE FROM THE SEA

Close-up image from a poster in the defining innovations series. Visit the APL website to view or download the full poster. <https://www.jhuapl.edu/about/defining-innovations>

## PLANETARY DEFENSE

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