Explorers scramble to build vessel that will reach Earth's deepest point

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It's been more than 50 years since humanity ventured to the deepest place on Earth, but four crews now are racing to make a return trip.

One of the futuristic crafts in the works comes courtesy of Graham Hawkes. For years his minisubmarine, which resembles an underwater fighter jet, has sat in a bare concrete room in Point Richmond, Calif.

This fall, it is destined for a muddy gorge in the Mariana Trench, the world's deepest known point, 36,000 feet below the surface of the Pacific Ocean near Guam.

Hawkes is in good company in the pursuit of what many think will be the next big thing in human exploration: manned submersibles that can maneuver through the crushing pressure at the bottom of the world.

"Avatar" director James Cameron is closing in with a team in Australia, and Florida-based Triton Submarines also is in the hunt. Another hopeful, scientist Sylvia Earle, is rounding out the pack with a kind of hovering deep sea space station, which her Alameda-based company promises will become a "world asset."

No one has visited the craggy, frigid spot seven miles below the surface known as Challenger Deep since 1960, when two divers plunged to the bottom in U.S. Navy's Trieste, a specially designed, deep-diving research vessel.

The challenge at the time was figuring out how to withstand pressures at the bottom of the sea - 1,000 times what we experience on land. Under those conditions, the slightest crack or weakness in a vessel spells instant death for anyone inside.

The Trieste's response was a hull reinforced with thick steel walls. The heavy craft used a traditional ballast system: Take water in to sink, release it to rise. Without the possibility of lateral motion, the two divers spent 20 minutes at the bottom of the world surrounded by their own sediment cloud.

The next explorers hope to take a look around.

A convergence of technological leaps - from ultra-strong materials to lightweight batteries - has rekindled interest in exploring this black world where photosynthesis doesn't happen.

British-born Hawkes has been at it the longest. His craft, the DeepFlight Challenger, is "a few weeks away" from seaworthiness, while his competitors are still in design and testing stages.

Hawkes thinks the sub would have already set the solo record and be sitting in the Smithsonian if not for the untimely death of its original owner, uber-adventurer Steve Fossett, in 2007.

As it happened, the Challenger languished until this past spring. That's when Virgin impresario Sir Richard Branson and his colleague Chris Welsh announced that they had bought the $5 million craft and would soon be taking it on an "epic adventure." It is Welsh who is set to make the historic dive to the Mariana Trench.

If conventional submarines are like elevators or hot-air balloons, Hawkes' subs, which replace heavy steel with carbon fiber and titanium,

are like fighter jets. With elongated fuselages and fixed wings, they use the same principles as an airplane - or, as Hawkes points out, a flippered sea creature.

The Triton team, which also announced in the spring that it was jumping into "the race to inner space," is using an entirely different but equally appealing analogy - the crystal ball.

"Our vehicle is completely transparent," Triton President Patrick Lahey said. "It is the cleanest, most elegant solution for the deep ocean."

The $15 million sealed glass sphere can carry as many as three people straight down to the bottom of the ocean.

Triton hopes to popularize deep sea tourism. Lahey imagines that the exotic marine denizens of the abyss one day will keep company with packs of hedge fund managers and thrill-seeking scions.

Cameron, meanwhile, has revealed that he is working on an $8 million steel craft that he plans to pilot to the trench. He has written in Wired Magazine that he was "infected by the deep-sea-exploration virus" during the filming of "Titanic."

Taking a more conventional path to the deeps is Sylvia Earle, a longtime Oakland, Calif., resident who is Hawkes' ex-wife. She has the enviable title of "explorer in residence" at the National Geographic Society.

With funding from Google Executive Chairman Eric Schmidt, Earle's company is designing a blimplike craft with cameras and robotic arms that will be able to stop and float in the depths. At $40 million, it costs more than three times as much as the other contenders.

Although Earle will most likely pilot the craft, the project is intended as

a resource for many scientists.

While others seek profits, adventure and scientific discoveries, Hawkes is hoping that the race to the deep will usher in the era of "flying" subs.

"It is the pointy end of the spear that will pierce open the realm of possibility," he said.

Hawkes, 63, pioneered the idea of deep sea sightseeing with the DeepFlight Super Falcon, which he sold to Bay Area venture capitalist Tom Perkins in 2008 and promptly replicated for himself.

The soft-spoken engineer billed the Falcon as "the first fully productionized submersible capable of sub-sea flight." So far, however, few researchers or well-heeled adventurers have come knocking.

Today, the sleek craft sits just beyond the mirrored double doors of Hawkes' cluttered Point Richmond headquarters, in the space you might expect to meet a receptionist.

While his peers acknowledge his genius for technological innovation, some also dismiss Hawkes as a monomaniac working on the fringes of the profession.

Soaring in the ocean may be cool, but if you're a scientist, what you really want to do is stop and hover.

"I love Graham's vision of flight," Earle said. "He's been smitten with the idea of flying in the ocean. But as a scientist, I need to be able to pause when I want to, to stay for minutes or hours."

Her craft will allow scientists to linger, as opposed to performing what she dismissively called "bounce dives" and "fly-throughs."

Other researchers spurn the notion of manned deep sea exploration altogether.

Chris Harrold, director of conservation research at the Monterey Bay Aquarium, has been to 19,000 feet in a safe, "workhorse" sub and has no desire to go deeper.

"Going down into a submersible to tropic depth is one thing," he said. "There's light, there's stuff to see, you're not freezing cold. Go deeper and most of the time you're in blackness."

There is little scientific incentive to risk lives when robots can do the job just was well, Harrold said, though he acknowledged that "there's this human spirit thing that we need to get a person down there."

The Hawkes, Cameron and Triton teams are pursuing the business model of the jet industry.

Hawkes offers $15,000, three-day underwater flight courses that regularly sell out, and he recently took the Falcon to Jordan at the request of the Royal Hashemite Court.

Ultimately, the best defense of the race to the deep may be sentimental, rather than scientific.

The exploration of our planet, Hawkes believes, is a fundamentally human endeavor. He expects his submersibles will one day float among the million-dollar yachts moored outside his fog-shrouded studio - not because of their commercial or scientific potential, but because of the allure of the unknown.

That is one point upon which all those racing to the deep can agree.

"We don't climb mountains halfway," Earle said. "There is no other place where we have access to where life exists with 16,000 pounds of pressure on it. How can we resist wanting to see who lives there?"

GRAHAM HAWKES' CLAIMS TO FAME

-Holds the record for deepest solo ocean dive with a 3,000-foot plunge he took while testing his Deep Rover submersible.

-Featured in the Dan Brown novel "Deception Point" as a "genius sub designer."

-Piloted one of his own crafts for a cameo as a henchman in the James Bond film "For Your Eyes Only."

-Has found more than 350 shipwrecks.