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Ambitions as Deep as Their Pockets

By [WILLIAM J. BROAD](#)



A new generation of daredevils is seeking to plunge through nearly seven miles of seawater to the bottom of a rocky chasm in the western Pacific that is veiled in perpetual darkness. It is the ocean's deepest spot. The forbidding place, known as the Challenger Deep, is so far removed from the warming rays of the sun that its temperature hovers near freezing.

"When I was a kid, I loved not only amazing ocean exploration but space, too," [James Cameron](#), the director of "Avatar," "Titanic" and "The Abyss," said in an interview. "I can think of no greater fantasy than to be an explorer and see what no human eye has seen before."

The would-be explorers can afford to live their dreams because of their extraordinarily deep pockets. Significantly, their ambitions far exceed those of the world's seafaring nations, which have no plans to send people so deep.

The billionaires and millionaires include Mr. Cameron, the airline mogul [Richard Branson](#) and the Internet guru [Eric E. Schmidt](#). Each is building, planning to build or financing the construction of minisubmarines meant to transport them, their friends and scientists into the depths. Entrepreneurs talk of taking tourists down as well.

The vehicles, meant to hold one to three people, are estimated to cost anywhere from \$7 million to \$40 million.

The first dive is scheduled for later this year. Since secrecy and technical uncertainty surround many of the ventures, oceanographers say the current schedules may well change.

The rush is happening now in part because of advances in materials, batteries and electronics, which are lowering the cost and raising the capabilities of submersibles. Still, the challenges are formidable.

Hardest to build are the crew compartments, whose walls must be very thick, strong and precisely manufactured to withstand tons of crushing pressure. Designers are using not only traditional steel but such unexpected materials as spheres of pressure-resistant glass.

Humans have laid eyes on the Challenger Deep just once, half a century ago, in a United States Navy vessel. A window cracked on the way down. The landing on the bottom stirred up so much ooze that the two divers could see little and took no pictures. They stayed just 20 minutes.

Forays to lesser depths have multiplied over the years. Since the [discovery of the Titanic at the bottom of the North Atlantic in 1985](#), hundreds of explorers, tourists and moviemakers (including Mr. Cameron) have visited the world's most famous shipwreck. It lies more than two miles down.

The Challenger Deep and similar recesses are part of a vast system of seabed trenches that crisscross the globe. The deepest are found in the western Pacific.

Over the decades, biologists have glimpsed their inhabitants by lowering dredges on long lines. Up have come thousands of bizarre-looking worms, crustaceans and sea cucumbers. More recently, undersea robots have filmed swarms of eels and ghostly fish, their tails long and sinuous.

In early April, Mr. Branson held a news conference in Newport Beach, Calif., to unveil his submersible. "The last great challenge for humans," declared Mr. Branson, the founder of Virgin Atlantic and Virgin Galactic, "is to explore the depths of our planet's oceans."

His solo craft, nearly 18 feet long, looked like a white-and-blue airplane with stubby wings and a cockpit. The curve of the wings is meant to drive the vehicle downward as it speeds through the water, rather than upward, as with an airplane.

Graham Hawkes, the craft's designer and a veteran maker of undersea vehicles, said in an interview that more conservative designs were possible but that his goal was "to advance the state of the art."

The winged craft and its mother ship cost an estimated \$17 million. The submersible is scheduled to plunge deep later this year, its pilot a colleague of Mr. Branson. (The venture is profiled at virginioceanic.com.)

A few weeks later, in late April, another team went public. It unveiled plans, rather than a nearly complete vehicle. The company, [Triton Submarines](#), based in Vero Beach, Fla., makes tiny submersibles with acrylic personnel spheres that carry two people down a half mile or more. The clear spheres provide much better viewing than the tiny portholes of traditional submersibles.

The company announced that it was ready to build a submersible to carry three people into the Challenger Deep. The vehicle's personnel sphere — seven and a half feet in diameter — would be made entirely of glass and open like a clamshell to admit passengers.

Glass might seem fragile. But as pressures rise, said L. Bruce Jones, the company's chief executive, "it gets stronger."

He said two people — a billionaire and a near billionaire — were talking separately about buying one or two of the craft, each costing \$15 million.

A company brochure says investors can expect to charge \$250,000 a seat for tours of the Challenger Deep.

Mr. Jones said the craft would drop fast, covering the seven miles in about two hours. That would leave hours of bottom time for exploration before the return trip to the surface.

“It’s not a publicity stunt,” he said of the planning effort. “We’re commercial vehicle builders. We want a product that can be used repeatedly without any difficulty — one that is very elegant, very safe and very competitive.”

The Triton venture is described at tritonsubs.com/images/36000-3.pdf.

Mike McDowell, a leading organizer of adventure tours, including dives to the Titanic, said he was talking to Triton and added that he expected the market for dives into the Challenger Deep to be relatively limited.

“It’s more an iconic experience than ‘Gee, everything was so beautiful,’ ” he said in an interview. “And you eliminate a lot of people on the fear factor.”

Mr. Cameron, the maker of Hollywood blockbusters, has kept a low profile and based his effort in Australia. Some five years ago, he formed a team that has been quietly building a submersible along traditional lines, only smaller. In an interview, he said its steel personnel sphere was just four feet wide and would accommodate just one person.

The sphere underwent a successful pressure test in September 2009, Mr. Cameron said. He said his team had overcome major problems with foam meant to buoy the heavy sphere: Early foam crumbled under pressure tests, threatening to rob the submersible of buoyancy and maroon it on the bottom.

“It’s not like you can call up AAA to come get you,” he said.

The team is building cameras for three-dimensional filming, Mr. Cameron said. Despite reports that the vehicle might be involved in an oceanic sequel to “Avatar,” he insisted that the deep craft had “nothing to do with my feature life” — though a documentary or two might be forthcoming.

“The only thing it has to do with ‘Avatar,’ ” he said of the vehicle, “is that it’s slowing me down.” He said that the craft cost \$7 million to \$8 million, and that chartering a mother ship for the expedition would run from \$30,000 to \$40,000 a day.

Mr. Cameron said test dives were scheduled for early next year. In the summer of 2012, he added, he and his team will dive in the western Pacific 12 to 15 times. The goal is to plumb not only the Challenger Deep but the Tonga and Kermadec Trenches, which lie north of New Zealand.

The filmmaker added that he was talking to oceanic institutes about developing long-term relationships for use of the submersible.

“We’ve gotten a pretty resounding response from the science community,” he said, “because they have such limited funding and access to these deep environments.”

Perhaps the least visible of the entrepreneurs is Mr. Schmidt, the executive chairman of Google — and the founder of the [Schmidt Ocean Institute](http://SchmidtOceanInstitute) and the Schmidt Research Vessel Foundation. The institute’s two oceangoing ships are quite large, 253 and 272 feet long.

Mr. Schmidt has also financed the development of an advanced submersible designed by [Deep Ocean Exploration and Research](#), a company on Alameda Island in San Francisco Bay. Its founder, Sylvia A. Earle, is an oceanographer and a former chief scientist of the [National Oceanic and Atmospheric Administration](#).

“We were proud to help her launch the project,” he said. “New technologies are needed to explore, map, measure and report on the oceans and marine life.” The advances, he added, “will help everyone and everything on earth.”

The craft, Deepsearch, is large and sleek by submersible standards. It looks like a fish or a torpedo. Holding up to three people, it would plunge seven miles in little more than an hour. Its personnel sphere, like that of the Triton model, is to be made of glass for better viewing.

“The goal,” says a company Web site, “is not a stunt dive” to the Challenger Deep but “a world asset capable of providing scientists with unlimited access to the deep ocean.”

A submersible that incorporated “every cutting-edge concept” might cost \$40 million, the company says. It plans to build a pair. The venture is described at www.deepsearch.org.

All the craft are to have large arrays of bright lights so they can illuminate the deep black sea.

If anyone thinks of the new explorers as grown-up children playing with expensive toys, ocean veterans reply that there is ample scientific justification for creating new technologies that can regularly plumb the full depth of the ocean, which covers more than 70 percent of the planet yet remains poorly explored.

“The result will be good,” said Don Walsh, a retired Navy officer who survived the descent to the Challenger Deep in 1960 and is advising some of the new ventures. “It will bring people around to remembering how little we know about the oceans.”