

WASHINGTON (AP) — Like a car salesman pushing a luxury vehicle that the customer no longer can afford, NASA has pulled out of its back pocket a deal for a cheaper ride to the moon.

It won't be as powerful, and its design is a little dated. Think of it as a base-model Ford station wagon instead of a tricked-out Cadillac Escalade.

Officially, the space agency is still on track with a 4-year-old plan to spend \$35 billion to build new rockets and return astronauts to the moon in several years. However, a top NASA manager is floating a cut-rate alternative that costs around \$6.6 billion.

This cheaper option is not as powerful as NASA's current design with its fancy new rockets, the people-carrying Ares I and cargo-lifting Ares V. But the cut-rate plan would still get to the moon.

The new model calls for flying lunar vehicles on something very familiar-looking — the old space shuttle system with its gigantic orange fuel tank and twin solid-rocket boosters, minus the shuttle itself. There are two new vehicles this rocket would carry — one generic cargo container, the other an Apollo-like capsule for astronaut travel. Those new vehicles could both go to the moon or the international space station.

What's most remarkable about this idea is who it came from: NASA's shuttle program manager John Shannon. He recently presented it to an independent panel charged with reviewing NASA's costly spaceflight plans. And he was urged to do so by a top NASA administrator.

It shows that top officials in NASA, an agency of engineers who regularly make contingency plans, worry that their preferred moon plan is running into trouble, space experts said.

Shannon says he likes the present return-to-the-moon design. But he said, "I think the cost numbers are going to give us problems." So for the past three

NASA manager pitches a cheaper return-to-moon plan



years, Shannon and a handful of others have casually tinkered with the shuttleless shuttle, an idea that has kicked around NASA for decades. The Shannon team did so with the permission of NASA and is not connected with another group of space program workers who drew up a different alternative to Ares and did so anonymously for fear of retribution from NASA officials.

"What I was doing was not a break from NASA," Shannon said in a telephone interview. "I don't care what launcher we use, I just want to go to the moon."

This is all happening while NASA's new moon program, called Constellation — as well as the entire human

spaceflight program — gets a hard look from an outside board as part of President Barack Obama's science policy.

And that panel's first reaction to Shannon's presentation was positive.

"Terrific, very well done," said panel chairman Norman Augustine, a longtime aerospace executive who noted he liked a similar proposal 20 some years ago.

Both the Augustine panel's reaction and the upper-level management fingerprints on the Shannon proposal suggest to space experts that NASA management may be shifting gears, or at least signaling its doubts about the costlier plan.

Howard McCurdy, an American Uni-

versity public policy professor who has written books about the space agency's decision-making, believes NASA management worries there won't be enough money for the Cadillac version.

"They are hedging their bets," agreed Keith Cowing, a former NASA engineer who runs the Nasawatch.com web site, which acts as a watchdog on the space agency. "It clearly reflects some doubts among senior agency folks in the overall veracity of their current approach."

NASA spokesman Michael Curie said Shannon was encouraged to make the presentation "in the spirit of sharing the options we've studied in the past."

But he added: "NASA believes the best plan is to fully fund the current architecture... This does not indicate a lack of confidence in or support for the current program."

Shannon said his numbers are rough and could change. The system would use hardware already built, like the engines, to save time and money. Eventually new engines would be built but from the old design.

Shannon's concept would use the same new Orion crew capsule being designed for Constellation. The only new vehicle would be the cargo container. Both would sit on the external fuel tank like the shuttle does now. When the crew capsule flies, it would be inside the cargo carrier at the top, with an emergency escape system.

And that "is the easiest part of the whole structure," Shannon said.

Another advantage of using the old shuttle system is that NASA wouldn't have to reconfigure its Kennedy Space Center launch site and use shuttle flight control systems, which would save billions of dollars, time and headaches, Shannon said. The new system could also launch a year earlier, and fewer space workers would have to be laid off because of that, he said.

The Shannon plan — called the Shuttle-Derived Heavy Lift Launch Vehicle — would only be able to carry two astronauts at a time instead of three or four. That might mean less of a moon base, Shannon said.

Whatever the final plan, Shannon said it all comes down to this: "I would like us to be in the lunar business."



New radar aims to detect illegal tunnels on U.S. border

border

Radar technology could help U.S. border patrol agents spot underground tunnels dug by human smugglers and drug traffickers along the border, according to the Department of Homeland Security.

Tunnel diggers have been hard at work along the U.S. border in recent days and months, the agency knows. Of every tunnel ever found by a patrol agent, 60 percent were discovered in the last three years, and patrollers spot a new one every month.

But "all of them have been found by accident or human intelligence," said Ed Turner, a project manager with the U.S. Department of Homeland Security (DHS) Science and Technology Directorate. "None by technology."

That's about to change, the agency stated this week. The DHS is working with Lockheed Martin to develop a ground-penetrating radar technology that would be designed specifically for finding underground tunnels. If successful, the tool will help agents locate and plug tunnels almost as fast as they can be dug.

The technology would consist of radar antennas placed in a trailer that would be towed by a patrol truck. The antennas send signals into the ground and use them to formulate a multi-colored picture of the earth. The tunnels show up as colored dots which agents would see on a monitor.

It's not really rocket science.

Ground-penetrating radar is already used by civil engineers to look beneath the surface. But they usually want to detect cables or pipes that may be only a few meters underground. Border patrol agents need to find tunnels that often are much deeper. Their radar technology will use much lower frequencies that penetrate deeper, as well as sophisticated new imaging that can display clear pictures of deep tunnels.

The Lockheed Martin team had a demonstration of an early scale model prototype this spring. And this summer, they will test out the technology on the U.S. Southwest border to see if it can separate tunnels from rocks, plants and other objects along the ground.

(Source: LiveScience.com)



Facebook picks David Ebersman as new CFO

NEW YORK (AP) — David Ebersman, a former executive at biotech firm Genentech, was named Monday as Facebook's chief financial officer.

Ebersman, 39, will formally start at the Palo Alto, Calif.-based online hangout in September.

He replaces Gideon Yu, who left abruptly in March. Facebook said at the time it was looking for someone with "public company experience," even though Yu had previously worked at Yahoo Inc. — which is public.

Ebersman hails from Genentech, which has been sold to pharmaceutical company Roche Holding AG.

"He was Genentech's CFO while revenue tripled, and his success in scaling the finance organization of a fast-growing company will be important to Facebook," founder and CEO Mark Zuckerberg said in a prepared statement.

Facebook, which turned 5 years old earlier this year, does not share specifics on its profitability because it is a privately held company.

Whaling chief says no guarantee of end to killing

FUNCHAL, Madeira Islands (AP) — There are no guarantees that negotiators from pro- and anti-whaling nations will settle their dispute within a 12-month deadline they have set themselves, the new head of the International Whaling Commission said Friday.

"I can't promise a final solution within a year. I hope at the very least we have the framework of an agreement at the end of that period," Cristian Maquieira said at the end of the IWC's weeklong annual meeting.

Delegates from more than 80 countries at the talks in Portugal's Madeira islands remained split between nations which support whaling and those that demand its end. However, they agreed to keep pursuing an agreement in time for next year's meeting in Morocco.

The stalemate, which has angered conservation groups, has lasted since a 1986 ban on commercial whaling.

Japan, Norway and Iceland together continue to harpoon around 2,000 whales annually. They argue that many species, such as minke whales, are abundant enough to continue hunting them. They are backed by around half the IWC's member nations.

The United States, Australia and the European Union, among others, want whaling to stop or at least be reduced.

Maquieira, a veteran Chilean diplomat who was elected IWC president Thursday, said both sides would have to compro-



mise.

"In the final outcome, not everybody's going to get what they want. If they want to have an agreement they're going to have to swallow some very tough decisions," he said in an interview.

Maquieira noted an improvement in the tenor of negotiations in recent years. In the past, delegates have stormed out of meetings and environmentalists were not allowed to attend.

Conservation groups attending the Madeira meeting as official observers were mostly unhappy about the IWC's decision to extend the negotiations for another year.

"The culture of avoiding clear decisions, including by voting if necessary, won't simply resolve any problem," said Nicolas Entrup of the Whale and Dolphin Conservation Society.

Other groups, however, said they were encouraged by IWC's willingness to address climate change and other environmental concerns.

The IWC was set up by whaling countries in 1949 to oversee their industry but it now has to deal with 21st-century threats to whales such as noise and water pollution.

"The tone and substance (of the talks) reflect a steady drift towards the IWC becoming a conservation forum and away from being a whalers' club," said Patrick Ramage of the International Fund for Animal Welfare, a U.S.-based conservation group.

Work begins on world's deepest underground lab

SIoux FALLS, S.D. (AP) — Far below the Black Hills of South Dakota, crews are building the world's deepest underground science lab at a depth equivalent to more than six Empire State buildings — a place uniquely suited to scientists' quest for mysterious particles known as dark matter.

Scientists, politicians and other officials gathered Monday for a groundbreaking of sorts at a lab 4,850 foot below the surface of an old gold mine that was once the site of Nobel Prize-winning physics research.

The site is ideal for experiments because its location is largely shielded from cosmic rays that could interfere with efforts to prove the existence of dark matter, which is thought to make up nearly a quarter of the mass of the universe.

The deepest reaches of the mine plunge to 8,000 feet below the surface. Some early geology and hydrology experiments are already under way at 4,850 feet. Researchers also hope to build two deeper labs that are still awaiting funding from Congress.

"The fact that we're going to be in the Davis Cavern just tickles us pink," said Tom Shutt of Case Western Reserve University in Cleveland, referring to a portion of the mine named after scientist Ray Davis Jr., who used it in the 1960s to demonstrate the existence of particles called solar neutrinos.

Davis and a colleague named John Bahcall won a share of the 2002 Nobel Prize for physics for their work.

The old Homestake Gold Mine in a community called Lead (pronounced LEED) was shut down in 2001 after 125 years. Pumps that kept the mine dry were turned off years ago, so workers have

Solar orbiter Ulysses ends mission after 18 years

LOS ANGELES (Reuters) — The interplanetary space probe Ulysses officially ceased operations on Tuesday after an 18-year voyage of roughly 5.5 billion miles (8.85 billion km) and nearly three complete orbits around the sun, NASA said.

Radio contact with the Volkswagen-sized spacecraft was halted by ground controllers shortly after 1 p.m. PDT/4:00 p.m. EDT, but NASA project manager Ed Massey said Ulysses will continue its wide, elliptical orbit around Earth's local star indefinitely.

He said there was a chance the probe might eventually swing close enough to one of Jupiter's moons to alter its course and place it on a path that will take it out of solar system and into interstellar space. The spacecraft was about 437 million miles (705 million km) from the sun at the time that its transmitter was switched off, Massey said.

Ulysses, a joint project of NASA and the European Space Agency, was launched from the U.S. space shuttle Discovery in October 1990 and became the first probe to fly around the sun's poles. As of mid-June, it had logged 5.4 billion miles and nearly three complete solar orbits.

Named for the hero of "The Odyssey," Ulysses was designed to help scientists study solar radiation and was originally expected to last for just five years.

By staying active for the better part of two 11-year solar cycles, Ulysses collected a wealth of information that formed the basis of over 1,000 scientific articles and two books.

Among its discoveries was a finding that the solar wind, a steady stream of charged sub-atomic particles blown out from the sun at about 1 million mph (1.6 million kph), has dwindled to its lowest level in at least 50 years.

The solar wind inflates a massive protective bubble, called the heliosphere, around the solar system. As the solar wind weakens, the heliosphere is expected to contract in size and strength as well, allowing more cosmic radiation — super high-energy electrons and protons zipping through interstellar space — to reach the inner solar system.

The Earth remains shielded from these potentially harmful cosmic rays by virtue of a magnetic field that surrounds our planet. But the diminished solar wind and corresponding rise in cosmic rays are a concern for astronauts and spacecraft that venture beyond Earth's orbit.

The biggest implications of those fluctuations, and other observations made by Ulysses, are scientific ones.

"The data acquired during the long lifetime of this mission have provided an unprecedented view of the solar activity cycle and its consequences and will ... keep scientists busy for many years to come," Ed Smith, a scientist at NASA's Jet Propulsion Laboratory in Pasadena, California, said in a statement.