Mars explorer duo on course

PARIS: European-Russian spacecraft were on course for Mars yesterday after crucial deep-space maneuvers in preparation for a daring mission to find evidence of life on the Red Planet. The Trace Gas Orbiter (TGO) mothership dispatched the tiny Mars lander called Schiaparelli Sunday on a three-day trek to the Martian surface in a key phase of the joint ExoMars project. There were nervous moments for ground controllers when the TGO, designed to enter Mars' orbit to analyze its atmosphere for signs of life, stopped sending status updates for about an hour before coming back online.

In the early hours of yesterday, the TGO successfully completed a planned maneuver to change course to avoid joining Schiaparelli on the Martian surface, the European Space Agency said. "Firing its engine for about 1m 46s raised the TGO's orbit by several hundred km 'above' the planet, ahead of its planned orbit insertion on Wednesday," the agency wrote on its ExoMars blog. And deputy flight director Micha Schmidt tweeted from mission control in Darmstadt, Germany: "on track for next big event: orbit insertion #ExoMars".

The TGO and Schiaparelli, launched into space in March, comprise phase one of the ExoMars mission. The TGO, with 600-kilogramme Schiaparelli on board, travelled seven months and 496-million kilometers from Earth before Sunday's separation.

It then headed for Mars orbit while the paddling pool-sized lander began a million-kilometer descent to the surface, where it is scheduled to arrive on Wednesday.

ExoMars is Europe's first attempt at reaching our neighboring planet's hostile surface after its first failed bid 13 years ago to place the first non-American rover on Mars. The TGO's job will be to sniff the Red Planet's thin, carbon dioxide-rich atmosphere for gases possibly excreted by living organisms, however small or primitive.

Life underground?

Schiaparelli's purpose, in turn, is to test entry and landing technology for a subsequent rover which will mark the second phase and high point of the ExoMars mission. After a two-year funding delay, the rover is due for launch in 2020, arriving about six months later to explore the Red Planet and drill into it, in search of extraterrestrial life-past or present. While any life is unlikely to be found on the barren, radiation-blasted surface, scientists say traces of methane in Mars' atmosphere may indicate there is something underground, possibly single-celled microbes.

Mars has become a graveyard for many a mission seeking to explore a planet that has captured the human imagination for millennia. Since the 1960s, more than half of US, Russian and European attempts to land and operate craft on the Martian surface have failed. The last time Europe tried, the British-built Beagle 2 disappeared without a trace after separating from the Mars Express mothership in December 2003. It was finally spotted in a NASA photo in January 2015. Mars landers must be built to survive a long trip from Earth, then a supersonic, scorching journey through Mars' carbon dioxide-rich atmosphere.

Elongated orbit

They require protection against a heat of several thousand degrees Celsius generated by atmospheric friction, extreme braking, and a soft touchdown in terrain where jagged rocks or craters could spell doom. Schiaparelli should reach the atmosphere at an altitude of 121 kilometers and a speed of nearly 21,000 kilometers per hour on Wednesday.

The extreme ride through Mars' atmosphere will take six minutes. A discardable "aeroshell" will protect the lander against the heat generated by atmospheric drag, while a supersonic parachute and nine thrusters will brake it.

A crushable structure in the lander's belly is meant to cushion the final impact. It is the first time this entry and landing combination is used, and the lessons learnt will be crucial to plan a safe landing for the much bigger and more expensive rover to follow. With a 10-minute delay-the time it takes for a message to reach Earth-Schiaparelli will send data on temperature, humidity, density profile and electrical properties.

Battery-driven and without solar panels, the lander should last for two or three days. The TGO will on Wednesday enter an elongated and erratic Mars orbit. It will then start a 12-month process of "aerobraking"-skimming the Martian atmosphere to bleed off energy-to change its orbit into a more regular, circular one. Once this is achieved, in early 2018, it will begin its work of sniffing the Mars atmosphere from about 400 kilometers for methane. — AFP

This file photo handout photo taken from the European Space Agency website on March 1, 2016 shows an artist's impression depicting the separation of the ExoMars 2016 entry, descent and landing demonstrator module, named Schiaparelli, from the Trace Gas Orbiter, and heading for Mars. — AFP

HONOLULU: A Hawaiian monk seal, an endangered species, lies on a Waikiki beach.

Much ado about poo: Feces fuels Hawaii feline debate

Monk seals under threat from deadly kitty litter

HONOLULU: Two wildlife issues have collided in Hawaii, pitting one group of animal defenders against another in an impassioned debate. The point of contention? Deadly cat poop and the feral felines that produce it. Federal researchers believe feces from the legions of feral cats roaming Hawaii is spreading a disease that is killing Hawaiian monk seals, some of the world's most endangered marine mammals. Some conservationists advocate euthanizing those cats that no one wants, and that's got cat lovers up in arms. "It's a very difficult, emotional issue," said state Sen Mike Gabbard, chairman of a committee that earlier this year heard and then abandoned a proposal to ban the feeding of feral cats on state land after an outcry. "It struck a nerve in our community."

The problem stems from a parasite common in cats that can cause toxoplasmosis, a disease that killed at least five female Hawaiian monk seals and three males since 2001, according to the National Oceanic and Atmospheric Administration. "While eight seals may not sound like a lot of animals, it actually has pretty large ramifications for an endangered population where there's only about 1,300 seals in existence at this point in time," said Michelle Barbieri, veterinary medical officer for NOAA's Hawaiian monk seal research program.

Contaminated water

Scientists believe monk seals become exposed to toxoplasmosis by ingesting contaminated water or prey. Felines are the only animals that can shed Toxoplasma gondii eggs, or oocysts. The parasites enter their digestive tract through infected prey then multiply in the small intestine and produce the eggs. Outdoor cats excrete the eggs in their feces, which researchers say washes into the ocean. The eggs accumulate in invertebrates that live along the sea floor, where monk seals often feed. They can survive in fresh water, saltwater and soil for up to two years.

Any warm-blooded animal can become infected. California sea otters have died from toxoplasmosis, and it's one of the major reasons the Hawaiian crow, alala, is extinct in the wild. Toxoplasmosis is rarely problematic for people with healthy immune systems, but it's why doctors advise pregnant women not to handle kitty litter. Many cities struggle with feral cats, but the problem is particularly acute in Hawaii because of its sensitive ecosystem and at-risk native species, experts say. Only two mammals are native to Hawaii: The hoary bat and the Hawaiian monk seal. "Everything else here- deer, sheep, goats, cats, mongoose - they're all invasive, they're all introduced," said Angela Amlin, NOAA's acting Hawaiian monk seal recovery coordinator, adding cats have no predators in Hawaii to control their population.

HONOLULU: Chris Allejo, the director of operations for the spaying and neutering program run by the animal welfare group Poi Dogs and Popoki, pets cats at feral cat colony. — AP photos

Native and invasive

Marketing research commissioned by the Hawaiian Humane Society in 2015 estimated some 300,000 feral cats roam Oahu alone. Marine debris, climate change, predation and human interaction all threaten the survival of Hawaiian monk seals.

But feral cats present their greatest disease concern, Amlin said. "As conservationists, what we really have to look at is this is what Hawaii's native ecosystem includes, and cats are unfortunately not part of that," Amlin said. "When it comes to the feral cat population, there should be a program in place to bring in these animals, adopt the ones that are adoptable and humanely euthanize those that are not." Others take offense to that notion.

Classifying animals with labels such as native and invasive creates a "hierarchy in which the protection of certain animals comes at the suffering of others," Hawaiian Humane Society President and CEO Pamela Burns wrote in a letter opposing the state Senate bill that would have banned cat-feeding on state land. She contended the 300,000 figure overstates the problem because the study looked at how many cats people were feeding and might have missed instances where multiple people fed the same outdoor cat. Those who care for stray cats advocate trapping, neutering and spaying to help control their population.

The University of Hawaii's Manoa campus, in Honolulu, started a feral cat management program - with authorized feeders trained in tasks like trapping and feces disposal - after the stench and mess from hundreds of cats prompted complaints, especially when children at a campus daycare center got flea bites, said Roxanne Adams, director of buildings and grounds. The program started in 2011 and appears to have reduced the number of felines, she said. Euthanizing cats is unacceptable unless they're extremely sick, said Alicia Maluafiti, board president of animal welfare group Poi Dogs and Popoki.

"I totally disagree with the ... generalization that cat people love cats more than these endangered species," Maluafiti said. "What we just don't advocate is the wholesale killing, the extermination, of one species ... for one." — AP