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पिथौरागढ़ में भूकंप के झटके

■ प्रस, देहरादून : उत्तराखंड के पिथौरागढ़ में मंगलवार को भूकंप के झटके महसूस किए गए। रिक्टर स्केल पर इसकी तेजी 4.9 आंकी गई है। झटके 20 सेकंड तक महसूस किए गए। लोग दहशत के मारे सुरक्षित स्थानों की ओर भागते दिखे। जान-माल के नुकसान की खबर नहीं है।

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हिन्दुस्तान

30-9-15

मंगल पर जल

मंगल ग्रह पर पानी की मौजूदगी की खबर ने सिर्फ वैज्ञानिक समुदाय को ही नहीं, विज्ञान में थोड़ी-बहुत दिलचस्पी रखने वाले हर व्यक्ति को उत्साहित कर दिया है। मंगल की सतह पर द्रव रूप में पानी की मौजूदगी ने वहां जीवन होने की कल्पना में नए पंख लगा दिए हैं। जिस किस्म के जीवन से हम परिचित हैं, उसके लिए पानी बहुत जरूरी है। और अब हम मंगल को जितना जानते हैं, उससे यह तो साफ हो गया है कि अभी मंगल ग्रह पर कोई विकसित जीव सृष्टि नहीं है, लेकिन अगर बैक्टीरिया जैसे आरंभिक सूक्ष्म जीव भी मिल जाएं, तो यह साबित हो जाएगा कि ब्रह्मांड में सिर्फ धरती पर ही जीवन नहीं है।

मंगल पर पानी कभी था, यह तो पहले भी मालूम हो चुका था। माना जाता है कि मंगल पर कभी महासागर थे। इसके अलावा वहां सूखी हुई नदियों के चिह्न मिले हैं। ऐसे रसायन भी मिले हैं, जो पानी के बिना बन नहीं सकते। माना यह जाता है कि मंगल के अस्तित्व के 450 करोड़ वर्षों में ज्यादातर पानी या तो उड़ गया या सतह से बहुत नीचे जाकर जम गया। बहुत कम पानी बर्फ के रूप में सतह पर मौजूद है, क्योंकि मंगल बहुत ठंडा ग्रह है। पिछले दिनों वैज्ञानिकों की टीम ने एक उपग्रह से मिलने वाली मंगल की तस्वीरों का अध्ययन करके पाया कि

मंगल पर दिखने वाली कुछ रेखाएं मंगल ग्रह पर गरमियों के मौसम में गहरी हो जाती हैं और सर्दियों में हल्की हो जाती हैं। वैज्ञानिकों ने अनुमान लगाया कि ये रेखाएं पानी की मौजूदगी का प्रमाण हो सकती हैं। उनका अनुमान यह है कि इस पानी में ऐसे रसायन घुले हुए हैं, जो मंगल पर गरमी के मौसम में पानी को लगभग -60 डिग्री सेल्सियस में जमने नहीं देते। जब स्पेक्ट्रोस्कोपी के जरिए इन गहरी रेखाओं में मौजूद रसायनों को

धरती से बाहर मंगल पहला ऐसा ग्रह है, जहां बहता पानी होने के सबूत मिले हैं, और जहां पानी हो, वहां जीवन की उम्मीद करना लाजमी है।

पहचानने की कोशिश की गई, तो यह पाया गया कि सचमुच वहां ऐसे रसायन मौजूद थे, जो पानी के जमने का तापमान बहुत घटा देते हैं। ऐसे रसायन बनने के लिए भी पानी की मौजूदगी जरूरी है। यानी पानी की मौजूदगी का कोई प्रत्यक्ष सबूत तो नहीं मिला, लेकिन जो सबूत मिले हैं, वे पानी के होने की संभावना को बहुत मजबूत करते हैं। अभी इतना ही कहा जा सकता है कि मंगल की सतह पर पानी बहुत कम मात्रा में और साल के कुछ हिस्से में ही हो सकता है और इस पानी में कई रसायन घुले हुए हैं। अब हम यह जानते हैं कि मंगल सूखा, ठंडा रेगिस्तान नहीं है, उस पर बहता पानी भी है। पहली बार हमें धरती से बाहर कहीं बहता पानी होने का ठोस सबूत मिला है। आगे हो सकता है कि हम जान पाएं कि मंगल पर वास्तव में कितना पानी है, और सतह के नीचे जो पानी है, वह कितना और किस रूप में है? इस खोज ने भविष्य के लिए कई संभावनाओं के दरवाजे खोले हैं।

जहां तक जीवन का सवाल है, तो अब उसकी खोज भी जोर-शोर से चलेगी। जहां अधिकतम तापमान -60 डिग्री सेल्सियस हो, वहां जीवन का होना मुश्किल है, लेकिन असंभव नहीं है। हमारी धरती पर ही ऐसे कई सूक्ष्म जीव हैं, जो गहरे समुद्र में या तपते रेगिस्तानों में रहते हैं, इसलिए यह भी मुमकिन है कि मंगल के तापमान और रसायन मिश्रित पानी में भी जीव जनप सकें। हालांकि यह अभी दूर की कौड़ी है। मंगल पर चल रहे इस शोध से हो सकता है कि इस खोज से हमें अपनी धरती पर जीवन की उत्पत्ति के बारे में ज्यादा जानकारी मिल सके। धर्मग्रंथों से लेकर विज्ञान की किताबों तक सब जगह यही धारणा दिखाई देती है कि जीवन की उत्पत्ति जल में हुई। इसलिए जहां जल है, वहां जीवन की उम्मीद करना लाजमी है, मंगल में जल मिला है, तो जीवन की खोज भी होगी ही।

Why finding water on Mars matters

The latest Nasa findings make it reasonable to assume that some form of life could have sprung up on the planet

Prakash Chandra

Few events since the Apollo moonshots have ignited so much interest as Nasa's announcement confirming the discovery of liquid water still flowing on Mars. "We now know Mars was once a planet very much like Earth with warm salty seas and fresh water lakes," Jim Green, Nasa's planetary science director, announced on Monday. This is a throwback to more than a century and a quarter ago when Italian astronomer, Giovanni Schiaparelli, electrified the world by claiming that he spotted "canali" (Italian for channels) on the Red Planet. At that time, excitement over the Suez Canal prompted a mistranslation of 'canal' to 'canals', fuelling speculation that intelligent life forms had built a system of canals on Mars. It even inspired HG Wells to write *The War of the Worlds*, in 1898, and visions of 'little green men' began stalking the earth.

Solid science, however, backs the latest findings. Nasa's Mars Reconnaissance Orbiter identified waterlogged salt molecules in the long 'streaks' seen flowing downhill on Mars. Earlier, it was a puzzle why these streaks materialised when it is warmer and faded when it is cooler.

"Something is hydrating these salts, and it appears to be these streaks that come and go with the seasons," said Lujendra Ojha, who first proposed the theory that Mars may have liquid salt water flowing through it during summers.

Although the first spacecraft arriving on Mars in the late 1960s and early 1970s found indications of flowing water on the surface—canyons, dried river beds, and lakes—scientists had to wait till 2001 for images from Nasa's Mars Global Surveyor to detect proof. Even after that scientists believed Mars was too cold to have liquid water—till last April, when Nasa's Curiosity rover found out that the soil on Mars was damp with liquid brine. Brine lowers the freezing point of water and this explains the salty streams on Mars.

This is in addition to the enormous quantities of ice that lie beneath Mars' poles. Heat a bucketful of soil from these regions, and you get more than half a bucket of liquid water. This buried frozen water probably accumulated in winter and sublimed in summer (ice doesn't melt into liquid water on Mars; instead it sublimates, or changes directly from solid to the gaseous state — much like 'dry ice' does on Earth). The presence of so much water

(enough to deluge the planet if melted) opens the door to an invaluable resource for manned Mars missions: From serving as a source of fuel, drinking water, and oxygen, to the landscaping of the Martian surface for human settlement someday.

The latest findings make it reasonable to assume that some form of life could have sprung up on Mars. Meteorites from Mars landing on Earth always hinted at this possibility. If scientists re-examine the tell-tale hydrocarbon molecules they found on a meteorite that fell in the icy Allan Hills of Antarctica in 1984, whose Martian origins have been proven, we may be in for more dramatic discoveries. If flowing water carved the vast canyons that characterise a good percentage of the ragged Martian surface, many Martian craters seem to have been produced by impacting bodies originating from the nearby asteroid belt. So it is quite possible that the hydrocarbons in the Allan Hills meteorite reached Mars from elsewhere. In other words, the microfossils within the Allan Hills could be signatures of alien life forms beyond Mars — somewhere out in the far reaches of interstellar space.

Prakash Chandra is a science writer.
The views expressed are personal.



Himachal » Community

27% deficit rainfall in state

Published on: Sep 30 2015 12:26AM

Bhanu P Lohumi

Tribune News Service

Shimla, September 29

The Southwest monsoons withdrew from Himachal along with northwestern states of Jammu and Kashmir, Uttarakhand, Punjab, Haryana, Rajasthan and some parts of West Uttar Pradesh, West Madhaya Pradesh and Gujarat, with 27 per cent deficit rains.

The state received 612.7 mm rains from June 1 to September 29 against normal rainfall of 841.8 mm. All districts, except Una in Shivalik foothills, had deficit rains. Una received 31 per cent excess rains (1,132.3 mm).

Mandi district received 906.7 mm (-17 per cent) followed by Hamirpur 931.3 mm (-14 per cent). The local MeT office said that variation of 20 per cent was considered normal.

Percentage wise, the lowest rainfall 145.7 mm was recorded in the district of Lahaul and Spiti which is 68 per cent deficit followed by Kinnaur 112.1 mm (-58 per cent), Sirmaur 773.8 (-48 per cent), Solan 759.1 mm (-24 per cent) and Bilaspur 703 mm (-20 per cent).

In 2014, the southwest monsoon withdrew from the Himachal on October 5 and cumulative rainfall during the last season was 521.8 mm, which was 38 per cent less than the normal rainfall.

While in 2015, the deficit was 19 per cent in June, 21 per cent in July, 27 per cent in August and 48 per cent in September while cumulative deficit was 27 per cent, Director of Shimla MeT station Manmohan Singh said.

During the past 12 years highest deficit of 46 per cent was recorded in 2004.

“The monsoon deficit would not have an adverse affect on kharif crop yield or production as the soil has sufficient moisture due to adequate periodical rain during July and August,” sources in the state Agriculture Department said.



Central team to study distress situation in Cauvery basin

BENGALURU/NEW DELHI: Sept 29, 2015, DHNS



The Centre on Monday decided to constitute a high-level committee to assess the ground situation on distress in both Karnataka and Tamil Nadu.

The Cauvery Supervisory Committee (CSC), chaired by Union Water Resources Secretary Shashi Shekhar, decided to constitute a team under the leadership of Central Water Commission chairman Ashwin Pandya and asked it to submit a report in two weeks after assessing the ground situation of distress with detailed data.

A representative from the Indian Metrological Department, and one official from Karnataka and Tamil Nadu will be in the team.

The CSC, which did not take any decision on releasing water from Karnataka to Tamil Nadu as demanded by the latter, also decided to meet again after getting the report from the panel.

“The team will collect more data about storage of water in reservoirs, standing crops, requirement of water for both drinking as well as irrigation purpose and rain forecasts and study and prepare a report on kind of distress situation in both the states. Based on the panel’s report, the CSC will take a decision on release of water from Karnataka to Tamil Nadu,” a senior official told Deccan Herald.

While explaining the reasons to constitute the panel, the official said: “With both the states claiming distress situation, the government has decided to constitute a committee. As the committee will have officials from both the states, let them collate all data and submit a report. Based on the report, the CSC will take a decision”.

In the meeting, attended by Karnataka Chief Secretary Kaushik Mukherjee, Tamil

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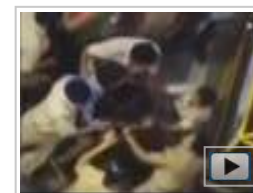
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Nadu Chief Secretary K Gnanadesikan and Kerala Additional Chief Secretary V J Kurian, the Union Water Resources Secretary asked both Karnataka and Tamil Nadu to cooperate on sharing of Cauvery waters as there is low storage in reservoirs in both the states. He also requested them to handle the shortfall situation collectively, the official said.

While refusing to release any water to Tamil Nadu, Mukherjee said that despite the distress situation, it had ensured 82.24 tmcft of water by September 26.
DH News Service

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FLOW OF NEW KNOWLEDGE

The Wet Planet

What the discovery of liquid water on Mars means — for scientists, exploration missions, the human race, and for the future attempts to colonise the Red Planet



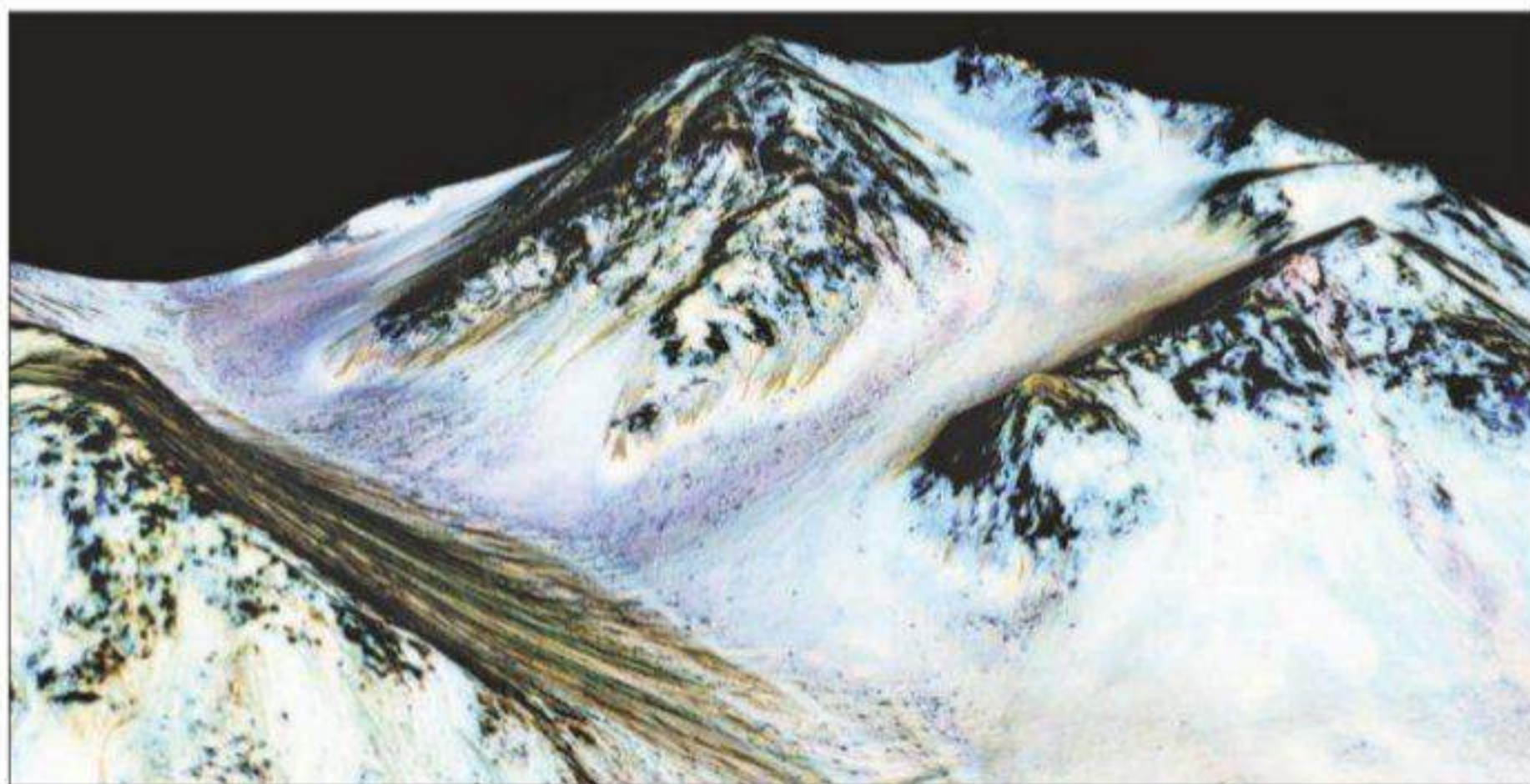
AMITABHA GHOSH

**SPECIAL TO THE
EXPRESS**

THE DISCOVERY of liquid water on Mars marks a major milestone in Martian Science. Barely a couple of decades ago, Mars was believed to be a dry and desiccated planet that once had flowing water and a dense atmosphere. However, Mars lost its atmosphere 4 billion years ago — and with it, the atmospheric pressure on Mars was reduced to less than a tenth of the atmospheric pressure on Earth, making water chemically unstable on the surface. Thus, liquid water is not stable on the Martian surface at present — water can be there either as ice or as water vapour.

The story of water on Mars unfolded over the last 20 years. When I worked on the Mars Pathfinder Mission in 1997, Mars was widely perceived by the scientific community to be devoid of water. In fact, there was a near consensus that the surface of Mars was composed of basaltic lava flows. I still remember the first analysis of a Martian rock ever, by the Mars Pathfinder Mission, revealed the composition to be different from basalt. The composition was andesitic — I had crunched the numbers, and had stayed up the night almost convinced that I was making a mistake. In science, there are usually no Eureka moments — instead there is an overall feeling that the observation does not make sense, i.e., it does not conform to existing wisdom and hence, might not be right.

In similar fashion, observations from Mars by a flotilla of spacecraft: orbiters, landers and rovers, over a couple of decades, have completely rewritten what we know about Mars today, including what we know about water on Mars! The year was 2002: Mars Odyssey, a NASA orbiter, had released maps showing an abundance of hydrogen around the South Pole of Mars. The hydrogen could potentially be in the form of water — but that was just one hypothesis with competing hypotheses stating that the hydrogen could be present in a form other than water. In five years, NASA launched the Mars Phoenix mission, to specifically verify if hy-



Dark, narrow streaks on Martian slopes such as these at Hale Crater are inferred to be formed by seasonal flow of water on contemporary Mars. The streaks, called "recurring slope lineae" or RSL, are roughly the length of a football field. The imaging and topographical information in this processed, false-colour view come from the High Resolution Imaging Science Experiment (HiRISE) camera on NASA's Mars Reconnaissance Orbiter. NASA

drogen present at the Martian South Pole was indeed water ice. Phoenix landed on the Martian South Pole in May 2008, and survived for about 150 days. The robotic arms of Phoenix scooped soil and ice from the surface, heated the material in eight ovens, and measured the composition of the gases with a mass spectrometer. As we discovered, this act is not as simple when you are remotely operating a spacecraft in extreme cold about 200 million miles away. The Phoenix mission established conclusively that the initial discovery of hydrogen by Mars Odyssey in 2002 was indeed water ice. Hence, for the first time in the history of Mars, NASA could map out huge deposits of ice, largely concentrated around the South Pole.

The discovery of liquid water is equally, if not more significant, than the discovery of ice. The discovery of liquid water below the subsurface makes a human mission logistically easier and cheaper, enhances chances of life on Mars, and provides a way to generate rocket fuel on Mars.

Imagine travelling to New York for six months. Imagine having to carry all the water that you would use. Now imagine travelling to Mars, or about 20,000 times the distance to New York, for 3 years, and having to carry all the water required from Earth.

Imagine how much water would be required to be transported over 200 million miles! If the source of the liquid water in Monday's announcement is not atmospheric but sub-surface, if there are sizeable reserves of water under the ground, if this water can be extracted in a cost effective manner, we might have an answer to the water problem for potential visitors for Earth. Availability of water on Mars makes the journey logistically easier and significantly cheaper.

The discovery of water on Mars is significant because life on Earth has been associated with water. There is a very important qualifier: life on Earth is associated with water, but water on Earth is not necessarily associated with life. Water on Mars does not necessarily imply that life exists on Mars — but nevertheless, it does increase the possibility of life. Life on Mars, assuming that it mimics life on Earth, would presumably need a host of factors to evolve and survive: like protection from radiation.

Last but not the least, the largest cost of interplanetary travel is the cost of escaping Earth's gravity and the gravity of Mars. The discovery of water on Mars can help pave the way for efficient conversion of the liquid water into oxygen that can be used as rocket fuel for the return trip. In fact, in the next Mars Rover

Mission to be launched in 2020, NASA will test out the first experiment that will try to separate oxygen from water on Mars — this technology in future could be used to generate oxygen from Martian water. This oxygen could be used for rocket fuel or for use by humans — again causing the cost and complexity of a human mission to drop very significantly.

Will humans ever live on Mars? Of course, they will. A hundred years ago, when Roald Amundsen and Robert Scott raced to reach the South Pole, the South Pole was perceived as a treacherous and inhospitable frontier. Today, McMurdo Station in Antarctica supports more than 1,000 researchers, who live in controlled environments throughout the year. In Mars, there is no reason humans cannot live in temperature- and pressure-controlled chambers that are shielded from radiation. The key will be to find resources on Mars that can be used to support humans during their temporary stay there. The discovery of liquid water, perhaps, is a small step towards this broader goal.

(Dr Ghosh leads Rover Operations on Opportunity Rover as Chair of the Science Operations Working Group of the NASA Mars Exploration Rover Mission. Opportunity has been traversing Mars for the last 11 years.)



DECCAN HERALD

Wednesday 30 September 2015

News updated at 2:13 PM IST

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Flash flood in Tirumala hills kills eight pilgrims

Hyderabad, Sept 29, 2015, DHNS



The toll in Sunday's mishap of a flash flood in the waterfalls above the Kapilathirtham temple at the foot of the Tirumala hills rose to eight on Monday as the police fished out one more body from the tank beside the temple.

Incessant rainfall in the Tirumala hills over the past week had swelled all the check dams and water tanks in the range, and subsequently led to a flash flood in the twin waterfalls above the historic temple.

The weather had been sunny on Sunday afternoon, but heavy rain in the upper levels of the Tirumala hill brought water cascading down at around 4:30 pm.

Several groups of pilgrims who went for bath and revelry in the waterfalls were caught unawares when the flood waters descended on them. The torrent threw the victims down with a thud into the holy tank, where some other devotees were take

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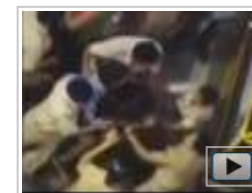
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a holy dip. Temple priests and the devotees noticed them fall and alerted the local authorities.

The first four deceased were identified as Venkatesh, Nikhil, Srikanth and Thowheed — all local automobile mechanics. Two of the three more bodies fished out late on Sunday were identified as those of Sachin and Varma Balaji. One more body of an unknown person was fished out on Monday morning.

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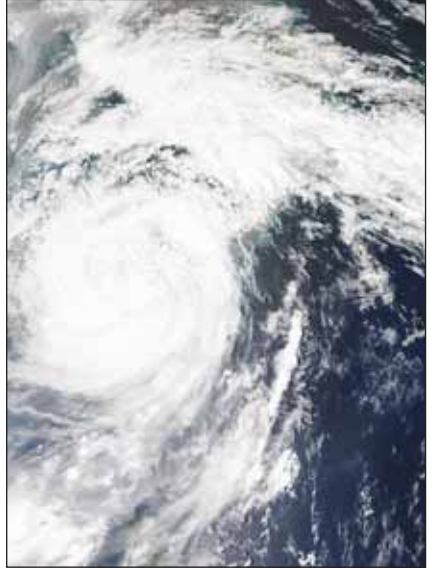
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RAJ K RAJ/HT PHOTO

चीन पहुंचा 'दुजुआन तूफान'

बीजिंग (रायटर): चीन सरकार ने भीषण तूफान 'दुजुआन' के खतरे के मद्देनजर आज पूर्वी प्रांत फुजियान में हजारों नौकाओं को समुद्र से वापस बुला लिया और इस इलाके के पर्यटन स्थलों को बंद कर दिया है। कल आये इस तूफान के कारण ताईवान में दो लोगों की मौत हो गई और सैकड़ों अन्य घायल हो गए हैं। सरकारी मीडिया ने फुजियान के बाढ़ नियंत्रण कार्यालय के हवाले से बताया कि लगभग 30 हजार मछली पकड़ने वाली नौकाओं पर सवार होकर समुद्र में गये एक लाख 60 हजार लोग तट पर वापस लौट चुके हैं। रिपोर्ट के मुताबिक इस तूफान से चीन के मुख्य हिस्से में कोई हताहत नहीं हुआ है। ताईवान सरकार ने आज इस तूफान से दो लोगों की मौत और 324 लोगों के घायल होने की जानकारी दी है। तूफान के कारण बिजली और पानी की आपूर्ति बाधित हो गई है। देश भर में सभी कार्यालय, स्कूल और शेयर बाजार बंद कर दिए गए हैं। सरकारी मीडिया ने बताया कि तूफान ने तटवर्ती शहर पुटियान में स्थानीय समय के मुताबिक सुबह आठ बज कर 50 मिनट पर दस्तक दी। इसके बाद यह तूफान कमजोर पड़ गया। इसके असर से फुजियान में मूसलाधार बारिश हुई है। चीन की सरकारी शिन्हुआ समाचार एजेंसी ने फुजियान मौसम विभाग के हवाले से बताया



कि 120 किलोमीटर प्रति घंटा की रफ्तार से तेज हवाएं चल रही हैं।

The Telegraph

calcutta, india

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| Tuesday , September 29 , 2015 |

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Business
Sports
Horse Racing
t2
Opinion

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Water surprise on Mars

- Strongest evidence of flowing liquid found

G.S. Mudur



A portion of the Martian surface, shot by Nasa's Mars Reconnaissance Orbiter, shows channels between 1 metre and 10 metres wide on a slope in the Hellas basin. **(Reuters)**

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New Delhi, Sept. 28: Scientists announced today that they had discovered the strongest evidence to date that salt-laced liquid water flows down hill slopes on present-day Mars, triggering fresh speculation about the chances of finding microbial life on the planet.

Using data from a US spacecraft orbiting the planet, scientists in the US and France have detected features on Martian terrain that they say could be explained as the seasonal warm flows of brine, or water impregnated with salts.

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"It is liquid water, but a thin film on the soil - it will be something like wet, salty sand with moisture creeping down a slope," Scott Murchie, a planetary geologist at the Johns Hopkins University Applied Physics Laboratory and a research team member, told **The Telegraph**.

The scientists observed dark streaks that appeared to ebb and flow over time, darkening and appearing to flow down steep slopes at several sites across the planet during their warm season and fading during the cool season.

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The streaks appear when temperatures rise above minus 23 degrees Celsius and disappear when the temperatures fall.

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Murchie and his colleagues, who analysed the streaks for five years, say they contain hydrated salts that lower the freezing point of water.

"The salts, which we believe are perchlorate minerals, attract water and keep it liquid at below freezing point," Murchie said. "We estimate the water on one of the slopes may be enough to fill up a swimming pool, but spread as a thin film over thousands of square metres."

Scientists say the new findings described today in the journal *Nature Geoscience* are significant because Mars has long been viewed as a prime candidate among solar system planets where conditions may have once existed to support at least microbial life.

"The big mystery is: where does this water come from?" Alfred McEwen, a senior scientist at the Lunar and Planetary Laboratory at the University of Arizona, told this newspaper. "We do not still understand the environment of Mars."

The discovery, some researchers speculate, is likely to boost the probability of finding microbial life on Mars.

"This does not guarantee Mars is habitable near the surface or is in fact inhabited (by microbes), but these features do provide a focus for where to explore in the future," McEwen said.

The dark streaks were spotted in 2010 by Lujendra Ojha, then an undergraduate student in Arizona, in data sent back by an instrument aboard Nasa's Mars Reconnaissance Orbiter, which has been orbiting Mars since 2006.

Ojha himself appeared today to split hairs between salt-laced liquid water and briny liquid. "We're not claiming that we found... evidence of liquid water. We found hydrated salts," Reuters quoted Ojha as saying. Nasa issued a news release headlined "...liquid water flows on today's Mars", and John Grunsfeld, the associate administrator at Nasa's science mission directorate, said: "It appears to confirm water - albeit briny - is flowing today on the surface of Mars."

Ojha, who is now at the Georgia Institute of Technology in the US, said today in a media release issued by Nasa: "We found the hydrated salts only when the seasonal features were the widest, which suggests that the dark streaks themselves, or a process that forms them, is the source of the hydration."

He added: "In either case, the detection of hydrated salts on these slopes means that water plays a vital role in the formation of these streaks."

Until now, all discourse of water on Mars had centred on ancient water or frozen water that make up the Martian ice caps. "The water we've seen is too salty to support microbial life, but there may be other sources elsewhere on the planet," said Murchie.

The other members of the research team were from Nasa, the Southwest Research Institute and the University of Nantes in France. Perchlorate salts had earlier been observed on Mars. Nasa's Curiosity rover had found perchlorates in the soil and some scientists believe that the Viking missions of the 1970s too detected signatures of these salts on the Martian soil.

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