



DHANEKULA INSTITUTE OF ENGINEERING & TECHNOLOGY: GANGURU DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING



Bi-Monthly Newsletter

TELE-ELECTRO

NASA's Opportunity rover mission on Mars comes to end



This infographic highlights NASA's twin robot Geologists, the Mars Exploration Rovers (MER) Spirit and Opportunity.

One of the most successful and enduring feats of interplanetary exploration, NASA's Opportunity rover mission is at an end after almost 15 years exploring the surface of Mars and helping lay the groundwork for NASA's return to the Red Planet.

The Opportunity rover stopped communicating with Earth when a severe Mars-wide dust storm blanketed its location in June 2018. After more than a thousand commands to restore contact, engineers in the Space Flight Operations Facility at NASA's Jet Propulsion Laboratory (JPL) made their last attempt to revive Opportunity Tuesday, to no avail. The solar-powered rover's final communication was received June 10.

"It is because of trailblazing missions such as Opportunity that there will come a day when our brave astronauts walk on the surface of Mars," said NASA Administrator Jim Bridenstine. "And when that day arrives, some portion of that first footprint will be owned by the men and women of Opportunity, and a little rover that defied the odds and did so much in the name of exploration."

Designed to last just 90 Martian days and travel 1,100 yards (1,000 meters), Opportunity vastly surpassed all expectations in its endurance, scientific value and longevity. In addition to exceeding its life expectancy by 60 times, the rover traveled more than 28 miles (45 kilometers) by the time it reached its most appropriate final resting spot on Mars -- Perseverance Valley.

"For more than a decade, Opportunity has been an icon in the field of planetary exploration, teaching us about Mars' ancient past as a wet, potentially habitable planet, and revealing uncharted Martian landscapes," said Thomas Zurbuchen, associate administrator for NASA's Science Mission Directorate. "Whatever loss we feel now must be tempered with the knowledge that the legacy of Opportunity continues -- both on the surface of Mars with the Curiosity rover and InSight lander -- and in the clean rooms of JPL, where the upcoming Mars 2020 rover is taking shape."

The final transmission, sent via the 70-meter Mars Station antenna at NASA's Goldstone Deep Space Complex in California, ended a multifaceted, eight-month recovery strategy in an attempt to compel the rover to communicate.

"We have made every reasonable engineering effort to try to recover Opportunity and have determined that the likelihood of receiving a signal is far too low to continue recovery efforts," said John Callas, manager of the Mars Exploration Rover (MER) project at JPL.

Opportunity landed in the Meridiani Planum region of Mars on Jan. 24, 2004, seven months after its launch from Cape Canaveral Air Force Station in Florida. Its twin rover, Spirit, landed 20 days earlier in the 103-mile-wide (166-kilometer-wide) Gusev Crater on the other side of Mars. Spirit logged almost 5 miles (8 kilometers) before its mission wrapped up in May 2011.

From the day Opportunity landed, a team of mission engineers, rover drivers and scientists on Earth collaborated to overcome challenges and get the rover from one geologic site on Mars to the next. They plotted workable avenues over rugged terrain so that the 384-pound (174-kilogram) Martian explorer could maneuver around and, at times, over rocks and boulders, climb gravel-strewn slopes as steep as 32-degrees (an off-Earth record), probe crater floors, summit hills and traverse possible dry riverbeds. Its final venture brought it to the western limb of Perseverance Valley.

More Opportunity Achievements

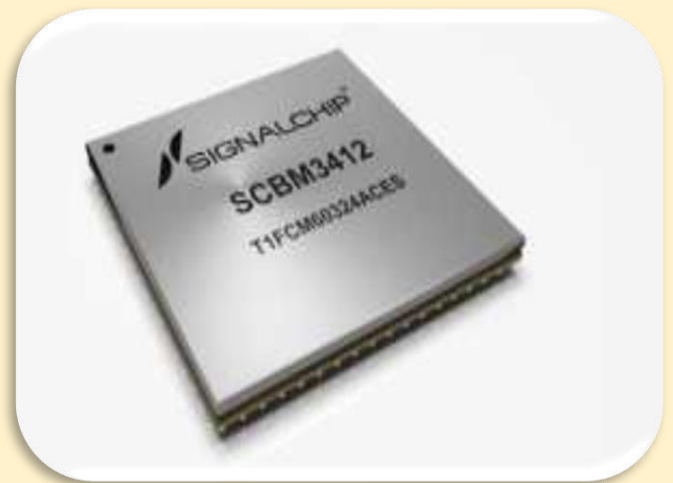
Set a one-day Mars driving record March 20, 2005, when it traveled 721 feet (220 meters). Returned more than 217,000 images, including 15 360-degree color panoramas. Exposed the surfaces of 52 rocks to reveal fresh mineral surfaces for analysis and cleared 72 additional targets with a brush to prepare

them for inspection with spectrometers and a microscopic imager. Found hematite, a mineral that forms in water, at its landing site. Discovered strong indications at Endeavour Crater of the action of ancient water similar to the drinkable water of a pond or lake on Earth. All of the off-roading and on-location scientific analyses were in service of the Mars Exploration Rovers' primary objective: To seek out historical evidence of the Red Planet's climate and water at sites where conditions may once have been favorable for life. Because liquid water is required for life, as we know it, Opportunity's discoveries implied that conditions at Meridiani Planum may have been habitable for some period of time in Martian history. "From the get-go, Opportunity delivered on our search for evidence regarding water," said Steve Squyres, principal investigator of the rovers' science payload at Cornell University. "And when you combine the discoveries of Opportunity and Spirit, they showed us that ancient Mars was a very different place from Mars today, which is a cold, dry, desolate world. But if you look to its ancient past, you find compelling evidence for liquid water below the surface and liquid water at the surface." All those accomplishments were not without the occasional extraterrestrial impediment. In 2005 alone, Opportunity lost steering to one of its front wheels, a stuck heater threatened to severely limit the rover's available power, and a Martian sand ripple almost trapped it for good. Two years later, a two-month dust storm imperiled the rover before relenting. In 2015, Opportunity lost use of its 256-megabyte flash memory and, in 2017, it lost steering to its other front wheel. Each time the rover faced an obstacle, Opportunity's team on Earth found and implemented a solution that enabled the rover to bounce back. However, the massive dust storm that took shape in the summer of 2018 proved too much for history's most senior Mars explorer. "When I think of Opportunity, I will recall that place on Mars where our intrepid rover far exceeded everyone's expectations," Callas said. "But what I suppose I'll cherish most is the impact Opportunity had on us here on Earth. It's the accomplished exploration and phenomenal discoveries. It's the generation of young scientists and engineers who became space explorers with this mission. It's the public that followed along with our every step. And it's the technical legacy of the Mars Exploration Rovers, which is carried aboard Curiosity and the upcoming Mars 2020 mission. Farewell, Opportunity, and well done."

Mars exploration continues unabated. NASA's InSight lander, which touched down on Nov. 26, is just beginning its scientific investigations. The Curiosity rover has been exploring Gale Crater for more than six years. And, NASA's Mars 2020 rover and the European Space Agency's ExoMars rover both will launch in July 2020, becoming the first rover missions designed to seek signs of past microbial life on the Red Planet.

Mr.S.Chandrasekhar
Assistant Professor , ECE

India's first indigenous semiconductor chips for 4G/LTE and 5G NR modems



Secretary, Telecom, Aruna Sundararajan said that Data Security is the paramount concern in the World today and India cannot remain secure in terms of data, unless it manufactures its own chips. She was speaking after unveiling of India's first Indigenous Semiconductor Chips by Bengaluru based semiconductor company Signalchip for 4G/LTE and 5G NR MODEMS in New Delhi. Terming the launch of the Chip as tremendously significant, Sundarajan said that India is just breaking into the elite club of the world and this will have huge implications for India's data security and data sovereignty, besides the positive economic implications. She informed that at present only 8 companies and a few countries can design and build semiconductor chips and launch of Indigenous Chip is in a real sense Make in India for the World. She said, the pioneering work will lead to a whole new architecture of tower building mainly in the light of emission complaints and growing environmental concerns. Sundararajan said that when US and China are battling it out for the

core ICT technology, India cannot lag behind, She said, even the high powered Committee formed by the Government of India and headed by Stanford University professor A.J. Paulrajto outline a road map for 5G telecom services has suggested breaking into the IPRs of 5G. She said, the launch of a world class product by Signalchip is start of the Third Wave, after Software and IndiaStack as First and Second wave. She also congratulated the Founder and CEO of Signalchip Himanshu Khasnis and CEO of global company ZOHO, SridharVembu for joining together to write India's most amazing success story. The RF sections cover all LTE/5G-NR bands upto 6GHz. These chips also support positioning using India's own satellite navigation system, NAVIC. The Agumbe series builds up on SCRF1401: India's first RF transceiver chip for high performance wireless standards like 3G/4G and WiFi, created by Signalchip in 2015.

Dr.G.L.Madhumati
Professor & HOD, ECE.

Bluetooth 5 is setting the stage for the future

Of smart home. Of audio. Of the IoT



Bluetooth is revolutionizing how people experience the IoT. Bluetooth 5 continues to drive this revolution by delivering reliable IoT connections and mobilizing the adoption of beacons, which in turn will decrease connection barriers and enable a

seamless IoT experience. Bluetooth 5 offers the flexibility to build IoT solutions based on feature need- range, speed and security can be adjusted for a variety of environments and end products. The increased speed of Bluetooth 5 lays the groundwork for the next generation of Bluetooth audio, and the increased range will deliver reliable IoT connections that make full-home, building, and outdoor use cases a reality.

Bluetooth 5 is ubiquitous

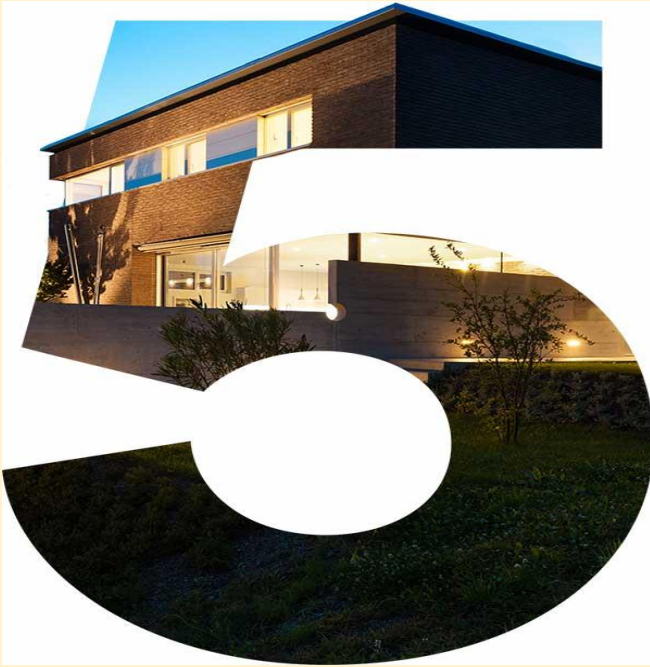
Bluetooth is unique in its ubiquity. No other wireless technology can match the install base of Bluetooth technology, with well over 10 billion devices. Bluetooth 5 includes updates that help reduce potential interference with other wireless technologies to ensure Bluetooth devices can coexist within the increasingly complex global IoT environment.



Bluetooth 5 delivers all of this while maintaining its low-energy functionality and flexibility for developers to meet the needs of their device or application.

Bluetooth 5 continues to power the IoT but with additional features that better enable industrial automation and whole home coverage by addressing challenges like range and download speeds. Bluetooth 5 is driving the beacon revolution, with improved location awareness and smarter technology that collects data to provide personalized experiences for the end user. Higher speed enables more

responsive, high-performance devices. Increased broadcast message size increases the data sent for improved and more context relevant solutions.



Bluetooth 5 continues to drive the revolution of how people experience the IoT, with the simple, secure connectivity you expect.

Bluetooth 5 is doing more with Bluetooth

Security Bluetooth adheres to U.S. federal security regulations, ensuring that all Bluetooth devices are capable of meeting and exceeding strict government security standards.

Low Energy The power-efficiency of Bluetooth with low energy functionality makes it perfect for devices that run for long periods on power sources, such as coin cell batteries or energy-harvesting devices. Bluetooth 5 offers the option of increased range or speed, and it's always low energy.

Coexists with other technologies Bluetooth 5 also includes updates that help reduce potential interference with other wireless technologies to ensure Bluetooth devices can coexist within the increasingly complex global IoT environment.

P,Nandini Devi, Roll No:168T1A0481,III ECE-B

WORKSHOPS, GUEST LECTURES & SEMINARS

Guest lecture on Latest Trends in VLSI Design

The Department of ECE has conducted the Guest lecture on “Latest Trends in VLSI Design” in association with Qsocs, Bangalore on 13.3.2019 at CSE seminar hall for III Year ECE students.



The resource person Mr.Venkata Krishna, addressed the students about the introduction to VLSI Design, design flow for VLSI Custom IC Design, latest trends in VLSI design and work flow in Different EDA Industries like Mentor Graphics, Cadence Design Systems, Synopsys etc., also clarifies the doubts about the IC industry for the students.



Workshop on PCB Design and Testing

The department of ECE has conducted the Workshop on “PCB Design and Testing” in association with Microlinks Peripherals and Controls Pvt Ltd, Vijayawada during 13th to 15th feb 2019 for II Year ECE students. The hands-on training has covered both simulation and hardware design of the PCB Design. the complete training has undergone by director Mr.A.Govindarao.



13	MANDAVA VAMSI KRISHNA
14	KALLURI VENKATESH

B.Name of Company: Gamma process Hub India Ltd.

Date of Drive: 06.03.2019

Package: 1.1 LPA

Number of candidates selected: 02

S.No	Roll No	Name of the Student
1	168T5AD421	Y.SESHU BABU
2	168T5AD403	B.RAJESH



C .Name of Company: Noveau Medicament Pvt Ltd

Date of Drive: 20.03.2019

Package: 2.4 LPA

Number of candidates selected: 10

S.No	Name of the Student
1	Harsha vardan
2	Sai Kumar Naidu
3	kalyan shoury
4	Ravi Teja
5	SK.Sameer
6	Ibrahim
7	Seshu Babu
8	Vamsi Krishna
9	Venkatesh
10	Suresh

D .Name of Company: Valeo Espana Sau

Date of Drive: 30.03.2019

Package: EUR €65000

Number of candidates selected: 02

S.No	Roll No	Name of the Student
1	168T5AD403	BURRI RAJESH
2	168T5AD421	Y SESHU BABU

PLACEMENTS IN ECE DEPARTMENT

List of Selected students in Department of Electronics & Communication Engineering

A.Name of Company: Surya Tech Ltd.

Date of Drive: 27.02.2019

Package: 2.6 LPA

Number of candidates selected: 14

S.No	Name of the Student
1	A VINAY
2	BURRI RAJESH
3	N SUBHASH
4	HARSHA VARDHAN.KONERU
5	M ANIRUDH
6	SK IBRAHIM
7	M VIKAS
8	KOLLURI VINAY
9	SK SAMEER
10	VANACHARLA RAJESH
11	J V S S CHANDRA MALLI KARJUNA
12	KOMMA AJAY KRISHNA

"If you want SHINE like a SUN, first BURN like a SUN."

Dr.APJ Abdul Kalam

Editorial and Design team:

Faculty: Mr.S.ChandraSekhar

Student Coordinators:

S.Rohith. B.Teena. K.Namratha S.Lohitha