



ACU WELLNESS

ACADEMY for ACUPRESSURE and ACUPUNCTURE (R)

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From the Chairman's Desk



It is really a great honour to write for this special issue which is being released on 21st Aug, 2019, in electronic form after the get together function of my 70th birthday at Hotel Chalukya. I did my schooling in a village Board High School and graduated in Mechanical Engineering from ACCET, Karaikudi which was under Madurai University. After a brief stint as JRF in PSG Tech, Coimbatore, I joined ISRO in the year 1972. just three years after the formation of ISRO. "ARYABHATA", India's first Satellite was my first assignment and "CHANDRAYAAN 1" was my last assignment before my retirement in Aug 2011. I am very grateful to all those visionaries who have given us training and made us part and parcel of the "ISRO CULTURE" which we continue to practice even after our retirement.

My avocation during my service in ISRO was Yoga Therapy and Acupressure cure for common diseases. As a scientist, I did not believe in the cure for headache with acupressure when Dr. Jiten Bhatt explained the method. With my own experiment and on my colleagues I was convinced with the therapy and wrote a book, which was released by Dr. Jiten Bhatt in our ISRO Centre sponsored by the Space Officers Association. I am very grateful not only to my Gurus, but also to all ISRO scientists, engineers and supporting staff for encouraging me throughout my stay in service.

The experience I gained in this healing science by treating my colleagues gave me the strength to establish an Academy for research in Acupressure and Acupuncture. **I would like to thank all the Trustees of the Academy for their faith and support that they have shown in this project.**

The senior team consisting of **Dr.Surendra Pal, Mr.Bhaskarnarayana, Mr.N.K Malik, Mr.Das Gupta, Dr.Kanaka Rao, Mr.R.N.Tyagi and Padmashree.V.R.Katti** has been with me till date, supporting my passion for an Integrated Acupuncture College to promote Acupuncture in Karnataka. I must thank **Shri. S. V. Ranganath**, Ex-Additional Secretary of Department of Space and Ex Chief Secretary, Karnataka Government for the total support provided to our acupuncture team for getting recognition from the State Government.

The Central Government has already recognized Acupuncture as a healthcare system. A high level committee appointed by the Centre will form the rules and regulations for proper education of Acupuncture in India. Guidelines for recognizing the existing acupuncture training centres and practicing acupuncturists will be also be issued.

We have come together to initiate an action plan for collaborating with International Universities who can set the syllabus for a five and half year course which will be in line with those conducted in China. We have already initiated a dialogue with the Chang Chun University for Chinese Medicine (CCUCM), Chang Chun and preliminary work has been done to sign an MOU for starting an Acupuncture college in Karnataka particularly in Bangalore. We have proposed to train atleast five experts in China and the Academy is planning to sponsor one or two students if funds are available. I request all supporters of the acupuncture system to donate liberally towards this specific purpose, so that an amount of Rs.10 lakhs can be generated within the next two months.

I thank you all once again for your best wishes on my 70th birth day.

H.Bhojraj

Three Steps For Success

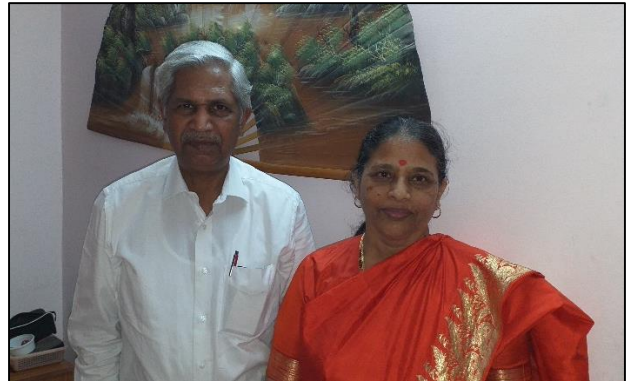
- 1) Find out the thing you love to do it, then do it.
- 2) Specialize in some particular branch of work and strive to excel in it.
- 3) Whatever you plan to do must benefit the humanity.



Supporters of Acupuncture - Group Nine



Thanking Shri.S.V.Ranganath



Dr. Bhojraj with Mrs. Meera Bhojraj



Mr.R.N.Tyaghi, Dr.K.Kanka Rao,Dr.Surendra Pal, Dr.Samiulla, Shri Jawed Akther, Principal Health Secretary, Shri.S.V.Ranganath, Dr.H.Bhojraj



Group Four for Training



Prof.Song Belin President of Chang Chun University for Chinese Medicine (CCUCM) presents a memento to Dr.Bhojraj in Hyderabad Conference



Cake Cutting

MISSION TO MOON- ISRO CHANDRAYAAN-2

Chandrayaan 2 is an Indian lunar mission that will boldly go where no country has ever ventured before to land on the Moon's south polar region. Most of Lunar Missions undertaken by other countries were taken place on Northern hemisphere or equatorial regions of Moon that include US Apollo Missions. Chandrayaan-2 is to explore uncharted territory and India will be the first one to land their spacecraft on South Pole region. Through this effort, the aim is to improve our understanding of the Moon and discoveries that will benefit India and humanity as a whole.

Why Mission to Moon?

The materials found at the surface of the Moon may provide valuable resources to support future exploration missions. This is especially true close to the lunar poles, where extreme cold conditions can trap water ice. These resources could be enabling for sustainable space exploration, but much remains unknown.

There is water ice (water molecules) present on the Moon as per the findings and confirmation from Payloads of Chandrayaan-1 (M3, Synthetic Aperture Radar (SAR) and Moon Impact Probe) MIP. While the quantity of water molecules is not precisely known, there is clear indication about the wide spread presence of water molecules extending from the lunar poles to 60 deg. Latitude including sunlit regions. This has created interest for venturing to mission to Moon. It should be noted that water on the Moon would not be in the form of Sea or lakes or ocean or puddles or drops, as one likely to imagine. One need to squeeze a cubic meter of lunar dust to get a litre of water.

On Moon's surface, it is expected availability of plenty of precise metals on Moon's surface. From stone samples brought from earlier lunar missions, the presence of metals such as Magnesium, aluminium, iron, silicon, titanium was spotted. Further earlier missions revealed abundant quantity of minerals - Platinum and Helium 3 on surface of Moon. Helium-3 (He3) is gas (non -radioactive and cleanest fuel) that has the potential to be used as a fuel in future nuclear fusion power plants. It is understood that there are one million tons of Helium 3 under one meter of Moon's surface. It would be sufficient for India with two tons of He-3 to meet entire energy requirements. There is very little helium-3 available on the Earth, if not rare and the fact that most related minerals like titanium and magnesium will eventually disappear. It is an attempt to find some things on Moon that will replace what are likely to lose on earth. This is one of the reasons why most missions are undertaken and studying the properties of Moon is a crucial aspect. Moon's low gravity has advantage in mineral extraction. Minerals can be processed in ways that are impossible on Earth.

It is advantageous to set up observatory on Moon to track objects for a longer period of time due to slow rotation of Moon and objects will be clear without any distortion and un-attenuation due to absence of atmosphere, which does not happen on earth.

A launch station is also possible to launch objects to other planets, as Moon's weak gravitational field would make it easier for launch. There would not be frictional drag or pull backwards happens on earth, which facilitates energy saving and use of lesser amount of fuel for launch.

What is special about landing on Moon's South Pole Region?

Moon's axis of rotation is inclined at 1.5 degrees to its orbital plane around the Sun. Consequently, the Sun always appears low and close to the horizon at the Lunar poles and most craters in the Polar Regions are in permanent shadow, never receiving sunlight. The lunar South Pole is especially interesting because of the lunar surface area here that remains in shadow is much larger than that at the North Pole. There is a possibility of the presence of water in permanently shadowed areas around it. In addition, South Pole region has craters that are cold traps and expected to contain a fossil record of the early Solar System.

Chandrayaan-2 Mission objectives:

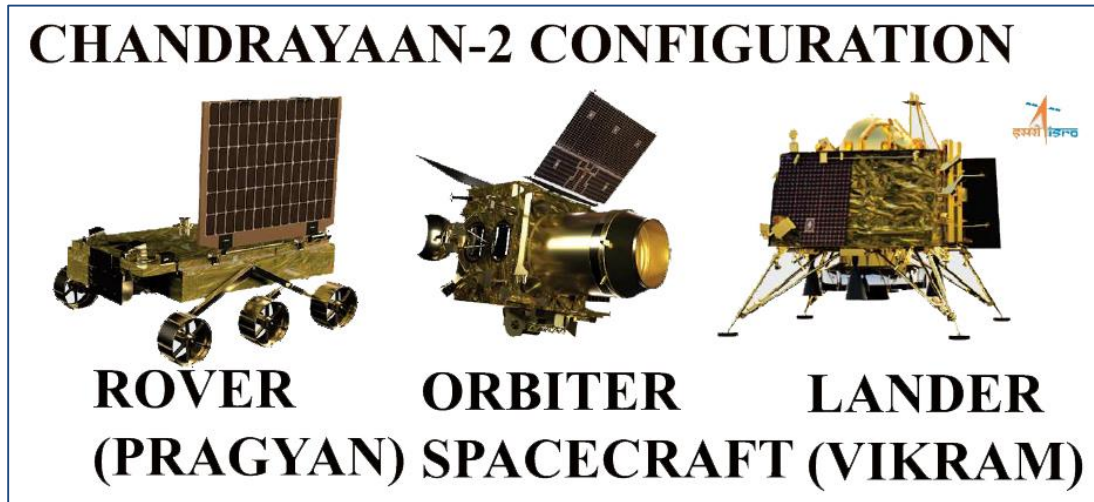
- Demonstrate capability to soft land on Moon and operate a Rover
- Study the presence and distribution of water in a more concrete manner further to findings of Chandrayaan-1
- Study of composition and structure of lunar elements
- Learn about early solar system to understand the history of earth

CHANDRAYAAN-2 CONFIGURATION & PAYLOADS:



Chandrayaan-1 was an orbiter (Remote sensing satellite) orbiting at an altitude of 100 KM (circular) around Moon and carried a lander (not designed for soft landing) besides other payloads namely Moon Impact Probe of around 35 KG, carrying a CCD camera, Radio altimeter and Mass

spectrometer and made impact /crash landed near Shackleton Crater “Jawahar Point” on South pole at a speed of 1.6Km/sec.



Chandrayaan-2 has a composite body (3850 Kg) of 1. Orbiter 2. Lander (Vikram) 3. Rover (Pragyan).

Orbiter has eight payloads. Lander has three payloads and Rover has two payloads.

Payloads in Orbiter will look for images of rock form elements such as magnesium, calcium, iron, images of science (finding water, minerals, Helium-3, study of Lunar exosphere for Sodium).

Lander will carry out experiments on Lunar quake, seismic activity. Thermophysical property of Lunar Surface (a probe will be inserted in to surface of Moon through 10Cm to find out Thermal profile, temperature conductivity over 10Cm, Atmospheric Lunar plasma (Variation densities).

Rover will conduct minerals and chemical composition of Lunar Surface.

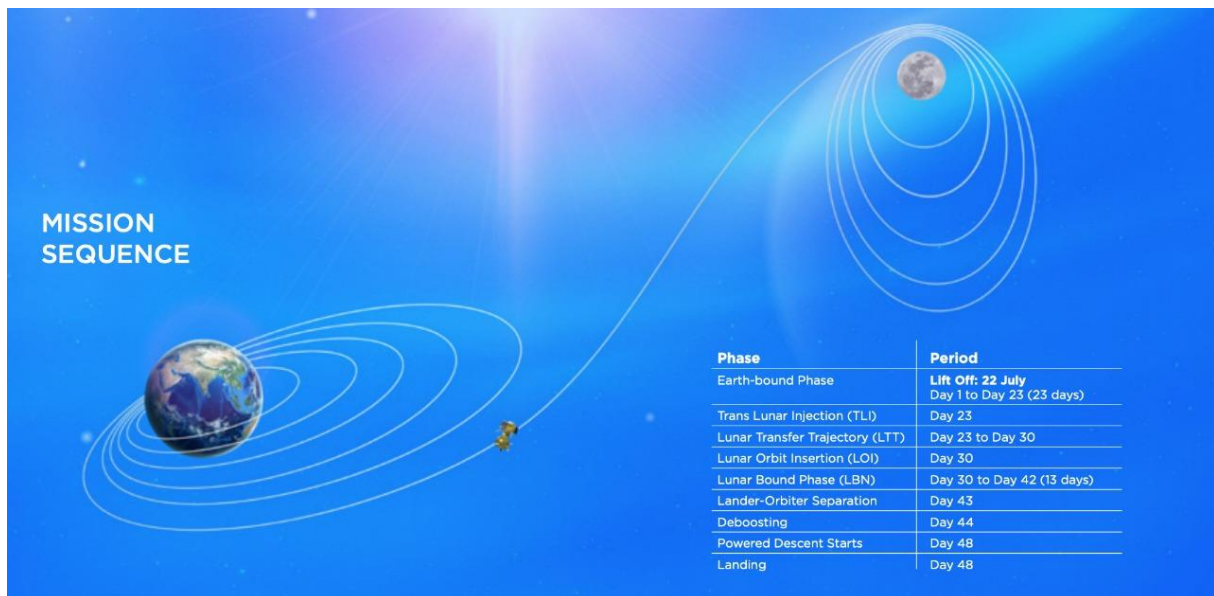
Orbiter will be communicating to Earth directly. Lander will communicate to Earth Directly. In case of problem (link failure), Lander will communicate with Orbiter and in turn orbiter will communicate to Earth. Rover cannot communicate to Earth in view of power limitation and it will communicate with Lander. Lander in turn, will send messages to Earth.

MISSION OPERATIONS - Highlights:

This composite body Chandrayaan-2 spacecraft onboard GSLV-MKIII was successfully launched to space on July 22nd,2019,1443 hrs in 170Km x 41000 Km elliptical orbit against 170Km x 39000 Km expected.

Orbit of Chandrayaan-2 spacecraft increased progressively five times (sling shot -Earth Burn) using Spacecraft propulsion system, during July 23 to Aug 06,2019 from the initial orbit achieved through launcher. On August 14th, at 0221 IST, final orbit raising manoeuvre was carried out with firing of liquid engine for 1203 Sec and Chandrayaan-2 entered Lunar Transfer Trajectory. The operations and health monitoring are being carried out from Mission Operations Complex (MOX) at ISRO Telemetry, Tracking and Command Network (ISTRAC) in Bengaluru with support from Indian Deep Space Network (IDSN) antennas at Byalalu, near Bengaluru.

After six days of travel of 3.844 L km distance (Earth to Moon), Chandrayaan-2 will approach Moon on August 20,2019 and the spacecraft liquid engine will be fired (Lunar Burn (LBN)) again in to a lunar orbit. Following this, there will be further four orbit manoeuvres to make



the composite body enter in to its final orbit passing over the Lunar poles at a distance of about 100 km from Moon's surface. Subsequently, Lander (with Rover) will be in action using its propulsion to reduce the orbit from 100x100 km to 100 x 30 km. In this orbit, Lander will be orbiting for four days. During this period, many checks will be carried out on the lander system and exact location for landing. On 4th day, when Lander is close to 30 km above Moon, real crucial and important event will happen.

On September 7th, Lander (Vikram) will soft land to Moon's surface (South pole). The propulsion system of Lander will function such that to break and bring down the velocity of Lander in a controlled fashion and make the Lander to land at a place near South pole. From breaking the speed, till landing, will take about 15 minutes. After landing, the door of Lander will open for Rover to slide down slowly from Lander to Lunar surface and it will take 4 hours. Subsequently, Rover will be roving on Moon's surface with its own propulsion system. The orbiter will be orbiting at 100 km x100 km circular orbit over moon and lander landed at one place will be static and Rover will be moving over surface of Moon with a speed of 1 cm/sec and during its planned life of operation, will move up to 500 M. Lander and Rover will have life of one Lunar day (14 earth days).

One full Lunar day, both Lander and Rover will be functioning and carrying out scientific experiments. Orbiter (Composite body less lander and Rover) will be circling the Moon at 100 km circular orbit and will have planned life of one year.

There are questions why Chandrayaan-2 is taking 48days to reach Moon when Apollo-11 took only 4 days. The answer lies in the build of the rocket and its power. India does not have a rocket powerful enough to hurl Chandrayaan-2 on a straight path to Moon, just a matter of 5 ½ days. It is the reason ISRO chose a circuitous route to take advantage of Earth's gravity, which aids slingshot of the spacecraft towards the Moon.

The spacecraft requires a minimum velocity of 11.2 km/sec to go to Moon. Of that, 10.3 km/Sec is provided by vehicle and 700 m/sec is being provided by spacecraft propulsion system. Being a small engine, operating the engine is not continuously done, but in short bursts to manoeuvre the spacecraft. Moreover, Moon's gravitational pull also being used to take the spacecraft to Lunar orbit. Though 29 days are being taken to reach the Lunar orbit, this method is most cost-effective way to travel to Moon. If we have a powerful engine like Saturn V (more than 39000 km/hr travel), it would have been possible to reach Moon in a single shot.



GSLV MKIII -M1 and CHANDRAYAAN-2



Wishing Team ISRO all the success to create history on the morning of the 7th of September, 2019, under the leadership of Dr.Sivan!!!

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Editorial team; Mrs. Jija Subramanian ,
Mr. Kannan (article on Chandrayaan 2)

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Dr. Bhojraj's 70th Birthday Celebration

On 21/08/2019 at Hotel Chalukya



Dr. Bhojraj with Dr. Samiullah and Dr. Peter Lee



Dr. Surendra Pal & Padmashree Katti's address



Dr. Bhojraj addressing the guests



Cross section of the guests



Dr. Basavaraj explaining the Nadiswara



The Badaga dance