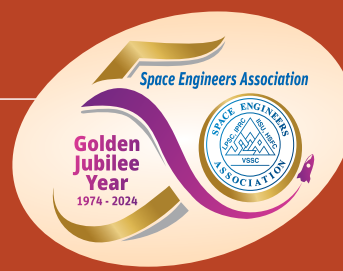


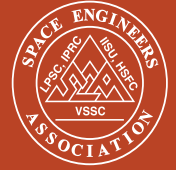
# SEA News

## Quarterly Newsletter



SPACE ENGINEERS  
ASSOCIATION

ISSUE #3



August 2024

### SEA OFFICE BEARERS 2024-25

#### PRESIDENT

Jayanthi V	SRS	5556
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Arjun Raj M	PCM	2866
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Krishnakumar S	LPSC	7371
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Dr. P. Ganesh	IPRC	04637-281804
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Senthil Kumar A	PCM	3813
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#### CULTURAL SECRETARY

Ashish Tomy	MVIT	7441
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## Message from Executive Committee, SEA

Space Engineers Association (SEA), for the last 50 years contributed immensely for the welfare of engineering community in the ISRO centres. We salute the founding fathers of SEA and place on record our sincere gratitude for their continuous efforts in keeping the vibrancy of the SEA activities for the last 50 years.

We, the EC team of 2024, have again trying to catalyse the activities by initiating various programs such as distribution of 2024 Diary, felicitation to superannuating members, Technical Talks, Insurance for members, Family tour (on hold due to weather) and Charity initiatives such as "Kits for Kids" and "Way Forward Wayanad".

We are in the process of regularising the SEA NEWS with first two issues released in March and May, 2024 and now with uplift of new design layout SEA NEWS.

We've an energetic and enthusiastic new Editorial Team of SEA, who have worked relentlessly to bring out the latest edition of SEA news with new perspectives and dynamic contents. We believe this edition will provide us the benchmark for continued improvement in information flow and opportunity for members/associate members and their families to portray their talents, share their experiences and lessons learned.

The SEA News shall become a rich source of information and provide a platform for exchange of ideas. We sincerely appreciate the efforts of the Editorial team who with their high tech editing skills have done an excellent job in compiling, designing and releasing the NEWS in a timely manner.

We wholeheartedly thank our active EC team for their sincere support in organising the various events. The continued support and encouragement from all SEA members, Associate members and Directors of the Centres and Chairman ISRO are the ones which is driving the team to take up new and challenging tasks.

**Nallaperumal AM**  
General Secretary, SEA

**Jayanthi V**  
President, SEA

### EDITORIAL TEAM

**Ramaswamy K | Archana C M | Swetha Lekshmi**  
**Shiv R Nair | Vidya L | Ambili K | Nallaperumal AM**

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## My Journey in ISRO

**Sri. M S Suresh**

Former Associate Director, LPSC

I started my career in LPSU/ISRO on 4th September 1986, after completing B.Tech in Mechanical Engineering from College of Engineering, Trivandrum, serving for almost 37 years and 9 months in this organisation. Coming from a humble background, I was always convinced from an early age that academic excellence was crucial for success in life. So securing a job at LPSU/ISRO particularly so close to my hometown and even before my B.Tech results were announced, was a big dream-come-true moment. I fondly remember my parents and my elder siblings for their unwavering support throughout my educational journey. Looking back, I feel privileged to have worked in one of the best scientific organisations of the country, whose space research efforts have largely contributed to the development of the country.

I started my ISRO journey in the Cryogenic Group. I was initially involved in the development tests on single element injector for the cryogenic engine, including bringing Liquid Oxygen for the first time to Mahendragiri test facilities from Karnataka Oxygen Limited. Later, I moved to the cryogenic turbopump development team, where we were working on the C12 turbopump (TP) development. The turbopump is one of the major and complex subsystems of any liquid rocket engine. This work was quite challenging, but at the same time interesting as we were dealing with cryogenic fluids for the first time. One interesting incident that I recall is during the testing of TP with LN<sub>2</sub>. After chilling the feed lines and pumps, the TP was not rotating after admitting gas to the turbine, which was later understood to

be due to lack of conditioning of the TP internal cavities which caused the freezing of moisture in the bearings. As a workaround, in the subsequent test, the TP was maintained at a lower speed by admitting a small flow to the turbine before starting the chilling of the pump. Later this issue was resolved by introducing proper conditioning of the facility feedlines and test article cavities by removing the moisture before starting the chilling of the pump.

Later on, the development of Cryogenic Upper Stage (CUS) with 7.5T cryogenic engine was initiated. As part of this program, I got the opportunity to go to Russia in 1993 for cryogenic technology acquisition. I was there for 10 months. Even though this program ended prematurely, the training in Russia for the development and testing of turbopumps was enlightening. It gave me a lot of insight on the configuration and working of high speed TP systems and on the extensive Russian documentation as part of hardware realisation and testing. After returning from Russia, activities towards the

realisation and testing of CUS engine turbopumps were taken up with high priority.

In 1995, to improve the payload capability of GSLV the activities for the development of a new 20T thrust indigenous cryogenic engine was initiated for the GSLV-MkIII (now LVM3) vehicle. This gave me a unique opportunity to be involved in the configuration, design, realisation and testing of the LOX and LH<sub>2</sub> high speed turbopumps from scratch. The experience gained from C12 development and CUS engine turbopumps were used here judiciously and as a result, the overall development and testing of both the turbopumps were very smooth, requiring only fine tuning of the systems based on the development tests. These turbopumps are the first indigenously designed, realised and qualified turbopumps for a liquid rocket engine by ISRO and are flying successfully in our LVM3 missions. In addition, both turbopumps are now qualified for an uprated thrust of 22T.

The most challenging technical task





in the development of CE20 TPs was the demonstration of axial thrust balancing system for the LH2 TP, which nullifies the axial load on the bearings. The development of this mechanism with a second stage pump impeller rotating at 38000 rpm with a clearance of ~200 micron with the housing and a provision for the movement of rotating assembly was extremely challenging. It was a moment of great relief and joy when the system worked flawlessly during the first high speed test, which was validated using a special axial displacement sensor.

In April 2010, I faced a major setback with the failure of GSLV-D3. This was due to the failure of the fuel booster turbopump during the start transient of the CUS engine. Even though the failure simulation tests could not capture the failure, by addressing all probable causes for failure, we ensured that the next GSLV-D5 in January, 2014 was a grand success. Once the cryo stage was ignited, the atmosphere in the mission control centre was so euphoric that it would always be an unforgettable moment in my life!

Later, I got the opportunity to lead the full cryo team as GD, CPEG from January 2014 to August 2015. After working throughout my career for cryogenic engine systems, in August 2015, I was elevated as DD, ESES (Earth Storable Engines and Stages) where the major activity in progress was the uprating of the Vikas Engine to the high thrust Vikas (HTV) engine.

In July 2016, I came back to the cryo entity as DD, CPES where the final engine and stage development and qualification activities of CE-20 engine and C25 stage were in the final phase. We made history on 5th June, 2017 by launching GSLV-Mk3 successfully with the indigenously designed and developed cryogenic engine and stage in its maiden flight.

During this period, the development activities of the 2000kN semi-cryo engine were also in progress. When the Semicryogenic Propulsion Systems Project (SPSP) was formed for an early induction of a semi-cryo engine in a Launch Vehicle (in LVM3 vehicle with SC120 stage replacing L110 stage), I was given the additional responsibility of PD, SPSP. Later in July 2019, I was elevated as AD, LPSC while retaining the post of PD, SPSP. I was also given the additional charge of DD, CSC from January 2024.

Looking back at the activities in SPSP, we could not achieve a breakthrough in the realisation of some of the engine systems. This was mainly due to the technical complexity of the engine in terms of handling the high temperature oxygen rich gas, the very high pressure levels, lack of understanding on many materials, processes & special coatings and the ignition behaviour of LOX and start fuel (TEA & TEB). In addition to this, design modifications were also warranted for some of the turbopump systems. Now we are learning the complexities of engine realisation and testing the hard way. The issues faced during the first ignition tests

on power head test article (PHTA) have now been understood after conducting many tests on the single element Pre-burner at PRLD/SPRE, VSSC. With the technical issues related to the realisation of stator housing, Thrust Chamber con-divergent segment, Mixing Head including the critical metallic coatings being resolved soon, we should be able to go ahead with PHTA and integrated engine tests.

Apart from technical activities, as a member and Chairman of various technical and other committees, I enjoyed my role and have done my best to contribute to the growth of the organisation. During my service here, in addition to various ISRO awards, I received the AeSI award 2014 for indigenization of aeronautical equipment (for CE-20 turbopump development) and Astronautical Society of India (ASI) award 2016 for rocket and related technologies.

Looking back, it has been a great honour and privilege to have worked with and learned from so many great people including various ISRO Chairmen, Centre Directors, all my superiors, peers and subordinates throughout my years in ISRO. It gives me immense satisfaction that I could also contribute towards enabling India to master the cryogenic technology for launch vehicles.

In this process of developing new technologies for our future space missions including the immediate requirement of propulsion and other systems for the Next Generation Launch Vehicle, I wish all my ISRO colleagues all successes in future endeavours.





# “Bum Bum Bhole”

Jayakrishnan K R, GSLV



“Adi Kailash” (Bon-po in Buddhism) is second of the five abodes of Lord Shiv and Parvati, others being Kailash-Mansarovar in Tibet, Kinner Kailash, Shrikhand Mahadev and Manimahesh Kailash in Himachal Pradesh. Adi Kailash is situated in the Indo-Chinese border, 45 kms away from Gunji deviating from the ancient route to Kailash Mansarovar. As Govt foreign policy has changed, the LAST villages of these borders have been assigned as FIRST villages and great development in infra structure has taken place. Good roads and mobile connectivity in the region is changing the place to one of the best spiritual tourism destination in the country from 2023 onwards. Earlier 8 days of arduous trek from Dharchula to reach these destinations can now

be reached in 2 days in motor vehicles. (See route map for details)

Kumaon Mandal Vikas Nigam Ltd (KMVN) under taken by Uttarakhand Govt(Like KTDC in Kerala) have many packages for these destinations during May to November and I had booked their express package for 5 days starting and ending from Kathgodam for 18 May 2024. I reached Pant Nagar (Nearest Airport) via Delhi by flight and KMVN Yatri Nivas at Kathgodam by taxi on 17 May 2024 and stayed overnight. My co-yatris were Smt. Swati Tulsiram Raje, a Naturopatist from Sattara, MH who have completed Kailash-Manasarovar parikrama in 2016 and Smt. Deeplaxmi Shikhare, a very enlightened spiritual house wife from Sangli, MH. Our guide from KMVN was Shri. Bhoopinder Singh Rawat a white water adventure sports trainer from Lohaghat. Customary welcome was given to us by KMVN at Kathgodam and we reached Dharchula, KMVN Guest House in a taxi arranged by KMVN and enroute visited the famous Golu Matha temple and Neem Karoli Baba Ashram. Dharchula is a border city with Nepal and we had a quick tour of Nepali market in the evening and stayed overnight in the guest house.

Next day a 4 wheel drive Bolero was allocated to us and the driver was Anand Kutiyal from Pangla village, in the ancient trekking route near to Budhi. We started at 8 am in the morning, new good tar road was made by BRO, however some places are bumpy due to the climate and mountainous terrain. On the way I could meet a Bhabhi now running a new dhaba near Malpa who had served me breakfast during my kailash-manasarovar trek in 2014, and

she served us refreshing tea. The road is through the banks of roaring kali river and enjoying the scenic beauty of the place, we reached Budhi and had some refreshments at KMVN Budhi Camp. The steep trek path from Budhi is now a tared road of 37 hairpin bends, leading to Chiyalekh a terrain famous for its rare flora, which now has large camp of ITPB. There is a checkpost in Chiyalekh and from Chiyalekh, the roads goes through Garbiyang to Gunji.

Guji has camps of ITPB and BRO and KMVN has a guest house and tents there. Guji is at an altitude of 11000 ft and a day's rest is recommended for acclimatization. We reached Gunji by lunch time and relaxed in the evening strolling through the streets. We came to know that now there are many home stays in Gunji and nearby Nabi villages and is crowded with tourists. Night though the temperature was freezing subzero, we had a good sleep in the sleeping covers provided by KMVN. KMVN has renovated the toilets in the camp and western style toilets are available. The village has now electricity and mobile coverage was poor in the area.

As per our package the first trip from Gunji was to Nabhidang, but considering more time to spend at Adi Kailash we started to Adi Kailash next day morning by 4 am. The workers of KMVN are very dedicated and served us breakfast of Dariya (milk porridge) and Upma. On the way we stopped at Kuti the FIRST village in the route, and further ahead there are many streams crossing the road, however BRO is maintaining the road motorable. We reached Jolingkong, KMVN camp at 14500 ft altitude near Adi Kailash by 7 am and had hot tea and





other refreshments.

Adi Kailash is just 2 km from the camp and ponies are available for those who find difficulty in walking. Myself and Swati decided to walk and Deeplaxmiji hired a pony. After darshan of the mighty mountain and prayers we started climbing the route towards Parvati Kund. Beyond the mountain peaks in this area is Chinese territory and in this route the bunkers of Indian army is visible. On the way we met the chief priest of the Parvati Kund temple Shri. Gopal Singh Kutiyal and along with him we reached the temple. The surroundings of the temple is serene and Swati took a dip in the lake. After spending 1 hr at the area we started way back to the base. There is another lake just at the foot of the mountain Gouri Kund and the route is dangerous and the pathway was washed off in landslide. However the pony handler took Deeplaxmiji to Gouri Kund and Swati also didn't have difficulty to reach the lake, while myself found difficult to climb further, carrying the oxygen and hot water bottles and backpack drained my energy, and returned to the base of Adi Kailash. A small temple is setup in the base and there is a big valley perfect for meditation. I spent some time in the base and when it started snowing went to Jolingkong camp. Since my co-yatris were getting late I took Anand, driver and Guide to the base in our Bolero and waited there for 1 hr.

Swati and Deeplaxmiji reached Gouri kund and performed Sakti pooja. They had to struggle a little to come back to the base, however was happy to see us there. We all together came back to the camp and a sumptuous lunch provided by KMVN. By 1 pm we started journey back to Gunji. We also planted a few Devdar trees in Jolingkong promoting forestation of the region. On the way back one of the stream, Ganesh nala, was over flowing on the road for 100m, however Anand very skillfully overcame the hurdles and we reached Gunji by 3 pm. We all took a hot bath and slept for some time. The weather was chilly outside and there was slight drizzle



and we slept in the comfort of the sleeping covers.

Next day we started for Nabhidhang by 5 am and reached KMVN Nabhidhang camp by 7 am. Shri. Hoshiyar Singh Rawat, who was KMVN guide during my Kailash Manasarovar yatra is the manager of the camp and we were happy to meet again. Though it was a bit cloudy in the morning, as we waited clouds moved away and we had the divine darshan of Om Parvat. The region got the name Nabhidhang because of the Nabhi mountain nearby, believed to be the Nabhi of Sati and is revered as a Shakthipeet. Nabhi mountain has many peaks and in one peak namely Nandhi the face of nandhi is carved in the snow by nature. The region is vibrating with great energy and Swati and Deeplaxmiji performed Shiv Sakti pooja and we all participated in that. After savoring hot and tasty alu parathas prepared by KMVN staff we started our journey back and it's a long journey today upto Dharchula.

On the way back we had Darshan at Kali temple at Kalapani from where

the mighty Kali river originates. The temple existed from the ancient times and is famous for performing rituals for close relatives after their death and submerging their remains. A cave believed to be the abode of Rishi Veda Vyas is also visible in the nearby mountain peak here. Nag Parvat peak is also visible on the way to Kalapani. We continued our journey and at Budhi camp stopped for some tea and refreshments and after a very tiring ride, we reached Dharchula by the evening.

Next day around 8 am we started from Dharchula to Kathgodam in taxi arranged by KMVN. We went through Patal Bhuvaneswar but due to huge crowd we couldn't enter the cave temple. Though we wanted to have darshan at Neem Karoli Baba Ashram again, the temple was closed by the time we reached there. It was raining and after a tiring journey with many waiting in the road blocks we reached kathgodam yatri Nivas. Next day morning I started for Pant Nagar and reached Thiruvananthapuram back via Delhi with a fully spirited heart from the Adi Kailash and Om parvat darshan.

KMVN has many packages for the Adi Kailash yatra and can be checked in their website <https://www.kmvn.in>. There are many private agencies also conducting the tour as many home stays have sprang up in the region. Since Kailash-Manasarovar Paryatan is on hold due to geopolitical situations, a spot near Nabhidhang is located from where the Mt. Kailash will be visible and the preparation of the road and other facilities are in progress, hopefully will be open to pilgrims/tourists soon.





## CUTTING EDGE

We are starting a new tech-series that gives an overview of breakthroughs in different engineering fields. This issue covers Cutting Edge in *Information Technology*.

**Kurian John, QDFS/SRS**



In July 2024, millions of individuals and businesses found their lives disrupted by a global IT outage caused by a faulty update to software issued by cybersecurity company CrowdStrike. The faulty update caused a calamity, impacting everything from Starbucks and McDonald's to Stock Exchanges and airports, resulting in projected losses of up to 5.4 billion dollars. Issues surfaced shortly after an update of CrowdStrike's Falcon sensor software was released to computers running the Windows operating system. The intended enhancement to bolster system security against cyber threats inadvertently led to devices encountering a "blue screen of death" due to flawed code. The company, in a root cause analysis, later identified the root cause as an out-of-bound array access in a shared memory area – This is a lesson to programmers and QA teams everywhere – take care of your pointers and interfaces!



### GenAI and Prompt Engineering

Generative artificial intelligence (GenAI) is artificial intelligence capable of generating text, images, videos, or other data using generative models, often in response to prompts given by the user. Generative AI models learn the patterns and structure of their input training data and then generate new data that has similar characteristics. OpenAI's ChatGPT, Google's Gemini and Microsoft's Copilot are GenAI tools that you may be familiar with. Prompt engineering is carried out by GenAI system developers where they guide the GenAI to generate desired outputs. A GenAI application developer must choose the most appropriate formats, phrases, words, and symbols that guide the AI to interact with your users more meaningfully. Prompt engineers use creativity plus trial and error to create a collection of input texts, so an application's generative AI works as expected.



### Blockchain

A blockchain is a distributed database or ledger shared among a computer network's nodes. They are best known for their crucial role in cryptocurrency systems like Bitcoin for maintaining a secure and decentralized record of transactions, but they are not limited to cryptocurrency uses. Blockchains can be used to make data in any industry immutable, the term used to describe the inability to be altered. The data could be in the form of transactions, votes in an election, product inventories, state identifications, deeds to homes, and much more. This versatility has resulted in Blockchain technology expanding from its original usage in Crypto currencies to banking, healthcare, property records archival and even food supply chain management.



### Beyond Brute-force Computing

Technology has become a big differentiator for businesses – the one who has the best computational ability has a clear advantage over its rivals. Most advances in computing performance have focused on how to get more zeros and ones through a circuit faster, by increasing the clock-speed, bit-width or number of processors. This approach, however, has its limitations and researchers are now looking at non-conventional ways of achieving better performance – Using specialized hardware as in GPU computing or employing technologies like Quantum Computing. Neuro-morphic computing is an emerging field, representing a fundamental rethinking of computer architecture at the transistor level, inspired by the form and function of the brain's biological neural networks. Despite many decades of progress in computing, biological neural circuits remain unrivalled in their ability to intelligently process, respond to, and learn from real-world data at microwatt power levels and millisecond response times. These new technologies will enable further advances in AI, autonomous vehicles, robotics, advanced prosthetics and neuroscience research.

*Courtesy: Internet*



*Hearty Congratulations !!!*

to **Dr Digendranath Swain** as Vigyan Yuva award winner and  
**ISRO - Team Chandrayaan 3** as Vigyan Team winner  
in the Rashtriya Vigyan Puraskar (RVP)-2024

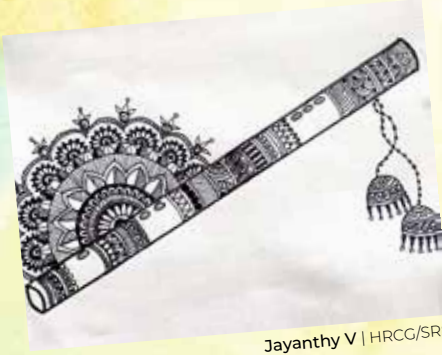




## CANVAS



Utkarsh | MME, LPSC



Jayanthi V | HRCC/SRS



Devanjali S | Std 8, D/O Sreejith T S, QDFS



Devanjali S | Std 8, D/O Sreejith T S, QDFS



Devanjali S | Std 8, D/O Sreejith T S, QDFS



Ambili K | VSSC



R Ushadevi | FCSD/AVN

*Hearty Congratulations !!!*

**Dr. S. Somanath**, Chairman, ISRO for induction into International Astronautical Federation Hall of Fame 2024 &

**Dr. S. Unnikrishnan Nair**, Director, VSSC

who was awarded IITM Distinguished Alumni Award for 2024.



**Way Forward Wayanad:** SEA announced a Way Forward Wayanad charity initiative to help affected families due to the tragedy at Wayanad. Last date is 15.08.2024. The support needed based on the advice of nodal officer at Wayanad will be extended through the funds collected from the above initiative.

**Please come forward and Let us support the noble cause!**



Rs 750/- is estimated for one kit. You can donate any number of kits as per your wish. Contribute the amount for the kits using below UPI ID or QR Code or Bank Account.



UPI ID: spaceea@sbi  
AC No: 10561683674  
IFSC Code: SBIN002279  
Bank: SBI, Thumba



Member No	Name	Division	Group	Entity	Area	Centre
202414399	PRIYA C KURIAN	SSDD	CESG	AVN	VRC	VSSC
202413626	MUSTAFA SHAHID	TTIC	TTDG	MSA	VRC	VSSC
202460086	ANIL JAISWAL	EPUSD	ESSG	ESES	VMC	LPSC
202410206	ARCHANA VV	RFIPD	EPG	ESAE	70 ACRE	VSSC
202491411	NEETHI RAJAN N	CMD	CON	ADMIN	VMC	LPSC
202465293	SHAIK GHOUSE BASHA	ESSD	ESSG	ESES	VMC	LPSC
202465224	SHREEJITH TV	PPEC		MSA	VMC	LPSC
202463783	SUJITH V	EEF	EESF	MME	VMC	LPSC
202465209	SYAMKUMAR S	NDTD	QCNG	SRQA	VMC	LPSC
202437142	SANTHANU S NAIR	TOMD	TMA	ADP	TERLS	VSSC
202430440	ATHUL P PRAMOD	SED	HTDG	ADP	TERLS	VSSC
202413096	KRISHNA KUMAR MISHRA	CVAD	SDEG	STR	VRC	VSSC
202413090	KURUDIMATH KOTTRESH MAHARUDRIAH	SDSD	SRLG	STR	VRC	VSSC
202412318	JUNA PK	EACF	APEP	SPRE	APEP	VSSC
202413481	MANOJKUMAR CK	DCBF	APEP	SPRE	APEP	VSSC
202437955	VINOJ VS	CSSND	NSG	LVIS	VKC	IISU
202413100	KARANDE VIKAS VIJAY	PFC	CSG	PCM	PFC	VSSC
202436980	SHYAM S NAIR	PFC	CSG	PCM	PFC	VSSC
202436380	SAJEESH KS	PFC	CSG	PCM	PFC	VSSC
202436525	SRIRANGAM SIRIPOTHU	PFC	CSG	PCM	PFC	VSSC
202430345	ARCHANA CM	ECDD	CESG	AVN	VRC	VSSC
202461413	HEMANT RAUSHAN	FAT-CM-WCH	CSPG	CSC	VMC	LPSC
202461851	JOJO JOHN	ESBSD	ESSG	ESES	VMC	LPSC
202413961	NIKHIL KUMAR MANARI	APDD	ABSG	CMSE	VKC	VSSC
202428224	WASEEM AHMED	CPMD	CCQG	CMSE	VKC	VSSC
202437910	VIJAYENDRA SINGH	CPMD	CCQG	CMSE	VKC	VSSC
202437911	VIGNESH G	SPAS	SGTG	IPRC		
202437912	KESAVA KRISHNAN	CEAD	CSEAG	IPRC		
202437913	BALASUNDARAM	TC-HAT	STHG	IPRC		
202437914	ANTONY NEETHI MANICKAM	MDA		IPRC		

## RLV LEX-03 Landing Experiment

The Indian Space Research Organisation (ISRO) has proudly achieved a Third consecutive success in the Reusable Launch Vehicle (RLV) Landing Experiment (LEX) on June 23, 2024. The third and final test in the series of LEX was conducted at 07:10 hrs at the Aeronautical Test Range (ATR) of ADE in Chitradurga. RLV LEX-03 re-demonstrated the reusability and autonomous landing capability of the RLV under more challenging release conditions (cross range error of 500 m & 2 error of azimuth) and more severe wind conditions. The winged vehicle, named 'Pushpak', was released from Chinook Helicopter at an altitude of 4.5 km (above MSL).

*SEA wholeheartedly congratulates  
Team ISRO for marvelous success of this landing experiment.*



## BOOK REVIEW

## IKIGAI

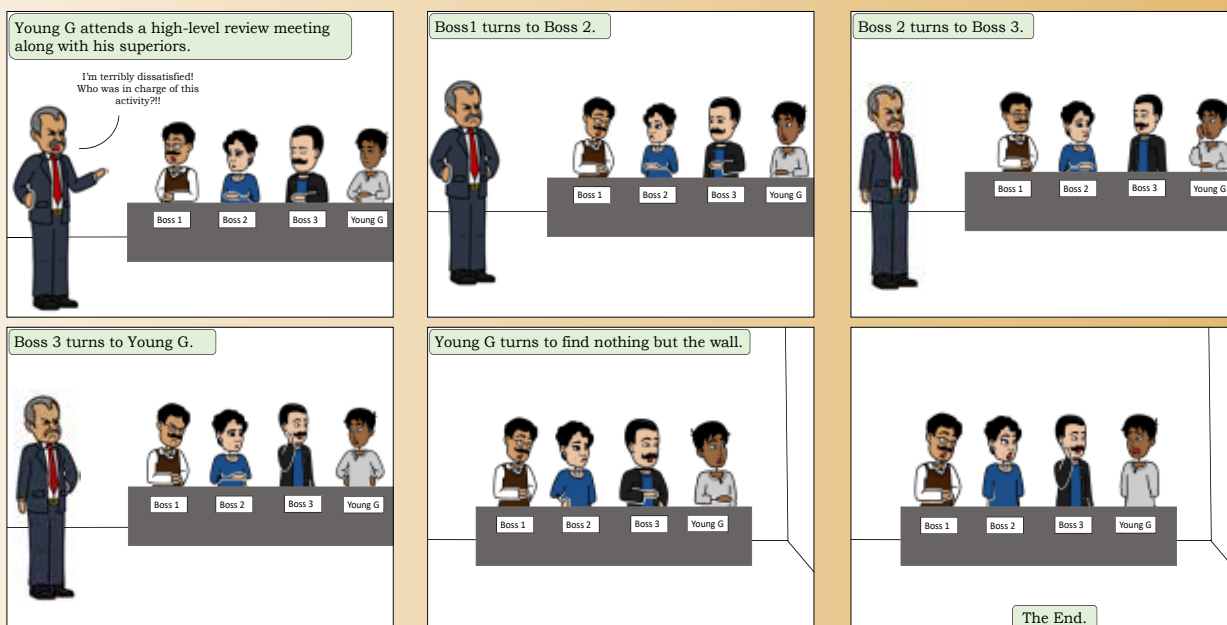
## The Japanese secret to a long and happy life

Héctor García and Francesc Miralles



- ▶ The book is about the people living in Okinawa who have found a way to live a happy and long life. People of Okinawa have found their **ikigai** and that makes them love whatever they do and love, their life style is active and all of these make their life long lasting.
- ▶ The book introduces you to some of the concepts of Japanese culture and value of **“the happiness of always being busy”**. It explains the art of staying young while growing old, scientific facts about food, active mind that would translate to youthful body.
- ▶ It shares what is stress and ways to handle it. Stress is accused of killing longevity. How does stress work and impact of cortisol on body. To be mindful about stress and work towards reducing it constantly, though a little stress does good to body and helps longevity.
- ▶ Later in the book they talk about **Logotherapy**, where a person has to keep rediscovering the purpose of life. The search for purpose into life, finding a driving force that helps to achieve goals.
- ▶ There is a chapter about **Flow**, which is the solution to the stress problem. The soul to life to find a flow, a flow is where there is no future, there is no past and there is only present. You are dissolved into the experience, no thinking, no distraction. Your ego dissolves and you become part of what you are part of what you are doing.
- ▶ A great focus is given to **keeping the body in action** in various section of the book, still a small chapter is added with different techniques and benefits of tai chi, yoga, radio taiso, qigong and breathing techniques.
- ▶ The book **ends** with a chapter on **resilience**. This is one of the golden ideas explained over last few pages. As everyone discover their ikigai and follow passion no matter what.
- ▶ There are some scientific data and many stories given alone which makes it little lazy to read in between. There are few chapters about the concepts and many chapters on the data and stories.
- ▶ The Book opens the doors of mind in case you have not discovered your ikigai, for someone who already living life with ikigai then it brings a closer look.

Nallaperumal A M, PCM/VSSC



Aziya Nizin | LARD/SEIG/MVIT



## Golden Jubilee Initiative: Spreading Light through Education

As part of our Golden Jubilee celebrations, the Space Engineers Association at VSSC, Trivandrum, has embarked on a heartfelt mission to support education for underprivileged students in the Trivandrum District. In a world where access to quality education is still a challenge for many, this initiative stands as a beacon of hope, providing essential educational aids to those in need. When this thought was put forth, it was met with an overwhelmingly positive response from our SEA members, who contributed generously.

The association, with the help of the Executive Committee (EC) team members, identified a list of Government and Government-aided schools where the need for support was most significant.

The association prepared and distributed approximately 600 educational kits, each meticulously assembled to meet the basic needs of a student. Each kit contained Five 150-page notebooks, drawing book, Crayons, Pencil, Pen, Eraser, Sharpener, Pencil pouch, Wrap paper and scale. These kits, though simple, can empower students to pursue their studies effectively with enthusiasm.

The distribution of these kits was more than just an act of charity; it was a deeply emotional experience for all involved. The team members were fortunate to witness the joy and excitement in the eyes of the

children as they received their kits. Even the school authorities recognized the significance of this initiative. Some of the teachers, who continue to serve their students selflessly despite not receiving a salary, also expressed their heartfelt gratitude.



One of the most touching messages came from the Chalai School, where the teachers noted, "The first grand event of the year was a charity event. It is also an encouraging thing for children. In addition to the list we have given, there are many more ordinary children; if you can provide them on another occasion, it would be very helpful."



The response from the students was equally heartfelt. One student expressed his relief and appreciation: "Kind attention to the respectable class teacher, it was a relief to my parents who were struggling without work because of the rains after the summer." Another student, Moinuddin, shared, "Sir, I am Moinuddin. I never forget to record my thanks to the ISRO Sirs who helped me with the book and other

study material."

We hope that by investing in the education of these young minds, the association has planted seeds of hope and opportunity that will grow and flourish in the years to come. The association is motivated to continue such efforts in the future, recognizing the ongoing needs of many more children who could benefit from similar support. This act of kindness serves as a reminder of the power of community and the difference that can be made when we come together to support those in need.



The schools selected for this initiative were (number of students given in brackets) :

1. Vlavatty Tribal LPS (40)
2. Kottoor LPS & UPS (40)
3. Manthikkalam LPS (40)
4. Kulathoor GHSS (75)
5. Govt. HW LPS School, Station-Kadavu (35)
6. St Thomas LPS School (30)
7. Karippur HSS, Valiamala (75)
8. Panakkodu, Valiamala (75)
9. Jagathy Govt. School (50)
10. Govt VHS School, PMG (50)
11. Chalai Govt. Tamil School (60)
12. Govt School, PMG (40)





## EXCLUSIVE

## Interview with CEO, Agnikul Cosmos



**Srinath Ravichandran**  
Co-Founder & CEO, Agnikul

*Agnikul Cosmos Private Limited is an Indian aerospace manufacturer based in IIT Madras, Chennai. The start up aims to develop and launch its own small-lift launch vehicle such as the Agnibaan, capable of placing 100 kg payload into a 700 km orbit. Agnibaan is envisaged to be a mobile launch system capable of placing a 100 kg satellite into a 700 km orbit. It will use clustered engines on first stage in various configurations depending upon the payload and will only use LOX and Kerosene based engines. A single-stage suborbital demonstrator, nicknamed Agnibaan SORTeD (Suborbital Tech Demonstrator) was successfully launched on 30 May 2024 as a suborbital test flight.*

**SEA:** As one of the successful first space startup company in India, what are your challenges faced in your journey and how do you address to face those?

**Agnikul:** Initial challenges were about lack of clarity on the policy front. However that has now been addressed with the formation of IN-SPACe. Also, fundraise has generally been a challenge since this is a new sector in India. However, as more companies are getting small successes/milestones proven this is also slowly changing.

**SEA:** Scaling up of technology to meet larger demands: What is unique technology or approach your startup planned to bring for space sector to realise space sector demands?

**Agnikul:** We wanted to build flexible space transportation systems. We have so many players in the world today attempting to build rockets but these come with many constraints such as forced rideshare to orbit or fixed mass pricing and so on. Agnikul is trying to change this by building flexible solutions with vehicle designs that are modular and can be sized for the payload/ orbit exactly. In the process, we have realized single piece rocket engines, mobile launchpads etc., which we were able to prove in our first demonstrator flight.

**SEA:** What are the changes you envision wrt private space sector against the space sector reforms announced by ISRO?

**Agnikul:** More private players would come up given there is policy clarity. Lot of aerospace engineers would stay back in India since there are more opportunities to work here. More FDI is possible since Indian startups typically attract that as well.

**SEA:** How do you navigate the regulatory mechanism in space industry?

**Agnikul:** We work very closely with IN-SPACe who have been great facilitators. Since they are a single point contact for us, they have been helpful with both helping us get access to testing facilities and authorization as well

**SEA:** Who are your target customers and how do you plan to reach them?

**Agnikul:** Anyone building a satellite less than 300 kgs in mass is a customer. We reach out to them in various conferences/public events where the industry comes together. Also once a launch is done, everyone gets to know about the availability of a new rocket since this information sharing happens by word of mouth as well.



## Felicitation for Superannuated Members

Bidding departure to the mentors at all times is a throbbing event. Their years of service are a testament to their perseverance, expertise, and passion. As they reach the significant milestone of superannuation, it is our bliss to extend our heartfelt congratulations and best wishes on a well-deserved retirement. Towards this, SEA has arranged a felicitation program on 20<sup>th</sup> May 2024. The program was privileged by the esteemed presence of Director, VSSC, Director, LPSC and Director, IISU. In his felicitation speech, Director, VSSC has remarked on the dedication, hard work and leadership rendered by them, which

have been a cornerstone of our success and a source of stimulation for us all. Their diligent efforts, untiring loyalty, and priceless contributions have made our organization a better place. Director, LPSC has expressed that the contributions they have made, left an inefaceable mark on our organization, their experience and wisdom have helped shape our organization's ethnicity and values. The seniors have seen us nurture, acclimatize, and evolve, and their insight has been instrumental in our success and their legacy will continue to guide us and make a positive impact. The other members also felicitated the super-

annuating colleagues, and expressed their gratitude for the wisdom and guidance shared over the years, the leadership, mentorship and friendship offered and setting high standards for excellence.

As you embark on this new chapter of your life, SEA wishes you joy, wellbeing, and fulfillment in all your future accomplishments. We recognize not only your professional achievements but also your personal qualities - your integrity, work ethic, and commitment to teamwork. May the next phase be filled with relaxation, adventure, and cherished moments with loved ones.

