Satellite Executive BRIEFING
Vol. 16 No. 5 June 2023
SATELLITE Markets & Research
Industry Trends, News Analysis, Market Intelligence and Opportunities

The Asia-Pacific Small Satellite Market

by Virgil Labrador

The Asia-Pacific (APAC) satellite market is the largest market for satellite services in the world. Extending from the Middle East at the Euarasia border to the vast Pacific ocean, it is not a homogenous market but also the most fragmented market of all the regions in the world. Leading reeearch companies estimate that the APAC market can comprise up to 60 percent of the world's market for satellite services.

So it's no surprise that with the explosion of Low Earth Orbit (LEO) constellations in the last few years, samll satellite manufacturers are eying the APAC market. A recent study by Research and Markets projected that the APAC small satellite market will grow from US$ 888.57 million in 2022 to US$ 4.2 Billion by 2028; at a CAGR of 29.6% from 2022 to 2028.

The increase in space investments in countries in China, Japan, India, and Australia, among others, is anticipated to drive the development and launch of small satellites in the region, according to the report.

Many companies are entering the small satellite market, owing to the diversification of applications for small

Continued on page 4

What's Inside

COMTECH™

Fluent in the Future

At Comtech, we're building the future of hybridized connectivity, with technology that integrates terrestrial and satellite communications networks.

Relentless pursuit of a better way: empowering people to connect everything and everyone.

www.comtech.com

EDITORIAL

Fare Thee Well: Martin Jarrold

Last month was the last contribution by our long-time correspondent Marrtin Jarrold, who has been writing his monthly "Market Intelligence" column since the beginning of the Satellite Executive Briefing in 2008. It is with a heavy heart that we bid him farewell after he has moved on from his position as Vice-President of International Development of the trade association GVF. The GVF has merged with the GSOA and Martin will be moving on to other ventures. We look forward to continuing the long cooperation that we have had with the GVF with GSOA.

Our association with the GVF was not just with the montly contribution by Martin on the key issues affecting the industry, but also in co-organizing and moderating panels at varoius conferences and trade shows all over the world. Martin was the consumate profesional and was highly organized and most insightful when it comes to coming up with the topics for conferences and panels. His depth of knowledge andd eloquent demeanor became the stanadrd for all GVF events. He was a total delight to work with and will defintely be missed.

We thank Martin for his invaluable contribution to the quality of the contect of our magazine and we wish him all the best in all his future endeavors.

Virgil Labrador

Virgil Labrador
Editor-in-Chief

Satellite Executive BRIEFING
Industry Trends, News Analysis, Market Intelligence and Opportunities

EDITORIAL

Virgil Labrador
Editor-in-Chief
virgil@satellitemarkets.com

Peter I. Galace
Elisabeth Tweedie
Associate Editors

Contributing Editors:

North America:
Robert Bell,
Bruce Elbert, Dan Freyer,
Lou Zacharilla
Latin America:
Bernardo Schneiderman
Europe:
Omkar Nikam *(Strassbourg)*
Hub Urlings (*Amsterdam)*
Roxana Dunnette (*Geneva)*
Asia-Pacific:
Blaine Curcio (*Hong Kong)*,
Naoakira Kamiya (*Tokyo),*
Riaz Lamak *(India)*

ADVERTISING

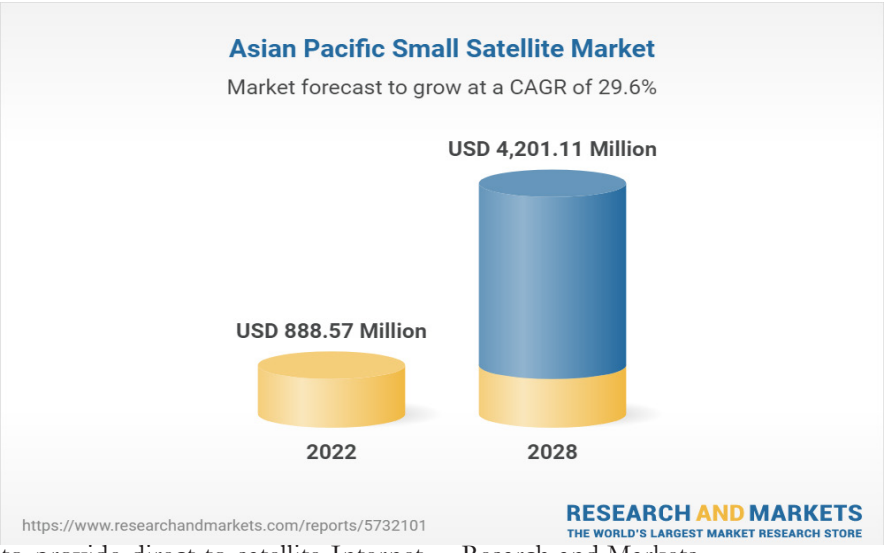
For Advertising enquiries send an e-mail to:
info@satellitemarkets.com

Satellite Executive Briefing is published monthly by Synthesis Publications LLC and is available for free at www.satellitemarkets.com
SYNTHESIS PUBLICATIONS LLC
1418 South Azusa Ave.
Suite # 4174
West Covina CA 91791 USA
Phone: +1-626-931-6395
Fax +1-425-969-2654
E-mail:
info@satellitemarkets.com

Asia Smallsat Market...

...from page 1

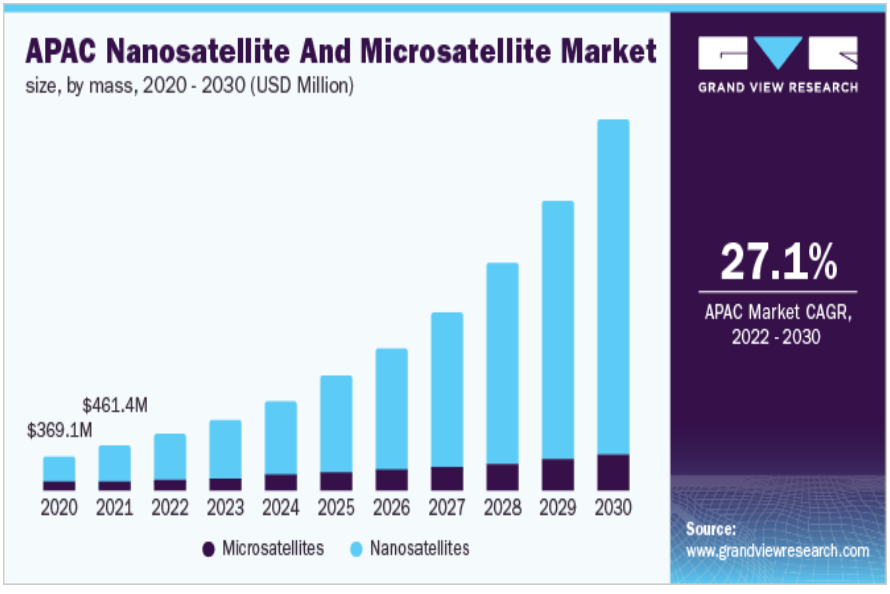
satellites. Many startups are utilizing small satellites for telecommunication, space-based Internetof Things (IoT), weather prediction, track assets, military surveillance, etc.



Key Market Trends

The nanosatellite segment of the small satelltie market accounted for the highest share in the market, and it is anticipated to continue its dominance over the market during the forecast period. The growth of the segment is mainly due to the increasing programs of nanosatellites in the region. Nanosatellites are widely deployed for earth observation and satellite communication applications. Various countries, like China, Japan, and India, among others, have been launching new nanosatellites. In order to increase its nanosatellite constellation to 50 satellites, in February 2019, Myriota partnered with Tyvak Nano-Satellite Systems Inc. to develop and launch multiple satellites, in 2019. These satellites will be used to provide direct-to-satellite Internet of Things (IoT) connectivity to its customers. Similarly, NanoAvionics was selected for manufacturing a 12U nano-satellite bus for the Singaporean research mission "Cathode-Less Micro Propulsion Satellite" (CaLeMPSat). Such missions are anticipated to accelerate the demand for nanosatellites in the near future.

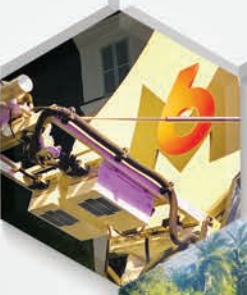
China accounted for the highest Market Share in the Asia-Pacific Small Satellite Market in 2019 according to Research and Markets.



China is investing heavily in the space-based capabilities, and according to the China National Space Administration, the country intends to launch about 100 satellites by 2025 and transform itself into a world-leading space power by 2045. The country launched approximately 40 nanosatellites during the 2018-2019 period. Various companies are investing in the development of small satellites to increase their satellite-based services. GalaxySpace, a communication satellite manufacturer, announced to invest about US$ 700 million to launch a constellation of small satellites, mainly to provide global 5G communications, for the airline and maritime industries, emergency, and disaster responders, etc. China launched a new remote sensing satellite as a part of Jilin-1 satellite constellation in November 2019 for commercial applications, like geological disaster prevention, harvest assessment, and resource surveys. The government plans to launch 60 satellites by 2020 and 137 by 2030. Such

OPTIMIZE YOUR
SATCOM TERMINAL

C-Band
From 5W
to 800W



X-Band
From 5W
to 400W

Ku-Band
From 4W
to 400W

Ka-Band
From 5W
to 80W

NOT A SIMPLE BUC
CHOOSE INTELLIGENCE
GET AN IBUC

Reliable high-performance Intelligent Block Upconverters backed by test data guaranteed by key performance indicators such as low phase noise, high linearity, & rated output power over temperature.

Explore all **IBUC** models at
TerrasatInc.com

IBUC 2

IBUC 3

TERRASAT
Communications, Inc.
Engineered to Endure

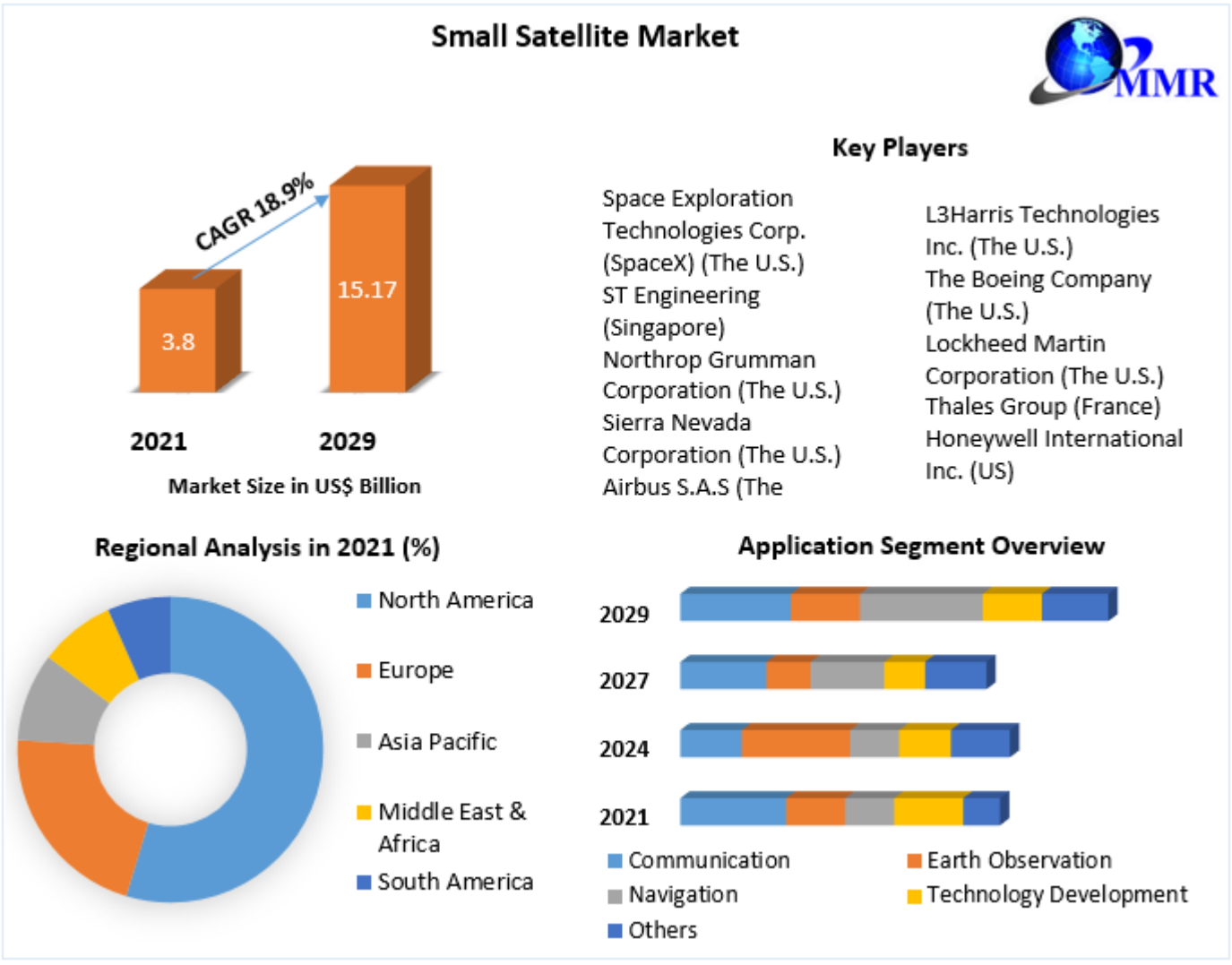
long-term plans are anticipated to propel the demand for small satellites in the country.

Competitive Landscape

Some of the key players in the APAC small satellite market include the Indian Space Research Organization, Beijing Commsat Technology Development Co., Ltd., Spacety, NanoAvionics, and Thales Group. Spacety is one of the major companies that provide 10, 20 to 50 kg, and 200 kg small satellite platforms to governments, research institutes, universities, and commercial companies. The company is currently developing MiniSar, a synthetic-aperture radar (SAR) satellite, scheduled to be launched by the third quarter of 2020. There are many players in the market, including several universities, government agencies, and the militaries, which are launching their own satellites, thereby increasing the competition in the market. Also, the growth in satellite-based services in the region is propelling the partnership of service providers and the satellite manufacturers in the region, which is anticipated to increase the share and presence of the satellite manufacturers in the market.

The government sector in the APAC is one of the key drivers not jjust in the small satellite market but in the satellite market as a whole. NSR/Analysys Mason Senior Director Jose del Rosario says the demand for broadband access in the region is a key driver, with as much as half of Asia's population of over 4.5 Billion with no or access to broadband services. Goverments of many countries in the region like in Indonesia, Malaysia, among others are spearheading broadband projects aimed at acheiving universal access.

Small satellites can be highly useful in military applications due to their short development time, low cost, and assembly line manufacturing processes. according to a report by Business Market Insights. In November 2021, the Indian Air Force Research Laboratory Space Vehicles Directorate announced that they had signed a contract with Tyvak Nano-Satellite Systems for experimenting in very low Earth orbit. Tyvak was awarded US$ 8.4 million for the satellite launch project and is projected to launch in 2024.



Also, in July 2022, the Indian Army announced that they wanted a small satellite for training its signals officers. For this, the army issued a request for information (RFI) to the Indian companies to design and develop the communication satellite.

Conclusion

Technological advances have made small satellite more capable and easier to design and build. There are a lso very promisijng market segments like IoT, Earth Observation, Enterprise, Government applications that are well-suited for smallsats. The entry level costs are reachable for the average entrepreneur and while this may lead to innovations in design and capabilities, it also brings increased competition. It will be intersting to see how all this will shake out in the coming years.

Virgil Labrador is the Editor-in-Chief of Los Angeles, California-based Satellite Markets and Research which publishes a web portal on the satellite industry www.satellitemarkets.com, the monthly Satellite Executive Briefing magazine and occasional industry reports called MarketBriefs. Virgil is one of the few trade journalists who has a proven track record working in the commercial satellite industry. He worked as a senior executive for a teleport in Singapore, the Asia Broadcast Center, then-owned by the US broadcasting company CBS. He has co-authored two books on the history of satellite communications and satellite technology. He holds a Master's in Communications Management from the University of Southern California (USC). He can be reached at virgil@satellitemarkets.com

OPINION

"There's More to the Universe Than What's for Lunch"

by Lou Zacharilla

The space and satellite industry is getting more and more interesting and more exotically retail. Consider this: right now you or a loved one can join three American ex-Presidents (dead ones) and have your remains "buried" in Space. The same company that will shortly exit these once-hailed chiefs offers a service that sends you there and even lets you track the remains as they pass over your home in low earth orbit. This mind-blowing "memorial spaceflight company" in Texas, Celestis, is doing it at a very affordable price point and is one of the best thought-through business models I've come across.

Say good-bye to embalming and hello to time traveling. Celestis, founded and funded by entrepreneur Charles Chafer sends cremated remnants of deceased individuals to earth orbit, the Moon, Deep Space or if the family wants your remains in the living room for eternity will send you up and back down again. According to the CEO of United Launch Alliance, Tory Bruno, the company will use Vulcan's debut to launch the DNA remains of John F. Kennedy and the father of my country (you know him as the face on the one-dollar bill), George Washington. The presidents will be in good company as they ride the amazing Vulcan, since the creator of Star Trek, Gene Roddenberry and his wife Mabel Barrett Roddenberry will be going up and out too.

If only Eleanor Rigby were around to see this!

ONLY the space and satellite industry can offer the world this kind of service. Celestis has thought through every detail of this oldest of businesses in the newest of environments.

Would You Baptize an Extraterrestrial?

Space is giving fresh perspective to another ancient human experience. The onne that feeds us meaning.

There's more to our brave new industry than the technology that gets us to space and benefits from it commercially. In fact, the marriage of science and awe have found new expressions and new champions. Consider that your remains might be observed by the distinguished astronomer and Carl Sagan Medal recipient Brother Guy Consolmagno, S.J.

The legendary Director of the Vatican Observatory, known as the "Pope's Astronomer," explores connections between meteorites, asteroids, and the evolution of small solar system bodies. He seeks to understand asteroid origins and structure.

Popes, by the way, have had an observatory since 1591! Brother Guy, who is an absolute rock star easily moves from faith to science and speaks of this in appearances on hip forums with titles like, Jesuits and Jedis. He has some of the most soulful sound bytes

MISSION MICROWAVE

Family of X-, Ku- and Ka-Band BUCs from 8-800 Watts

STINGER

25 W Ka-Band

55 W Ku-Band

50/80/100 W X-Band

JAVELIN

50/100 W Ka-Band

100 W Ku-Band

TITAN

200 W Ka-Band

200 W Ku-Band

The New Shape of Solid State

Available with Full Ka-Band Coverage for LEO/MEO/GEO Terminals and Gateways

in our industry, such as, "There's more to the universe than what's for Lunch," and my favorite, "Religion gives me a reason to do science." He even has his own asteroid, 4597 Consolmagno. 4597 is not as sonorous as a Gregorian chant, but the discovery of 4597 was just as wondrous.

If you want further out sounds – which to some are sacred - we've got those too.

In fact, your ashes or DNA can be sent to the great beyond by a musical track made up of the atonal belching of black holes https://tinyurl.com/dz3k9c7m as well as riffs of exploding galaxies and asteroids. Neither a Gregorian Chant or the Berlin Orchestra, it is one of the most creative compositions of our moment, courtesy of NASA's Chandra X-Ray Observatory in Cambridge, Massachusetts. At Chandra there is a visualization scientist, the Observatory's lead, Dr. Kimberly Arcand, who has been delving into data sonification with passion. If her name rings a chime, you may know her from her Smithsonian series "How to be a Scientist," which brought attention to the 3D visualizations of astronomical objects.

She has put together an album from the sounds of the Universe.

Dr. Arcand and the lab were kind enough to give SSPI the rights to use the music for my podcast, The Better Satellite World and a new series called The Road Less Travelled. The series, which includes my conversations with her as well as Brother Guy and Colby Youngblood, the president of Celestial, drops in a few weeks. You can subscribe to the Podcast at www.sspi.org/podcasts. But you can hear the sound of Dr. Arcand's celestial compositions every Monday because the track Deep Field South, in X-Ray Light is the new title song for our Podcast!

"...There's more to our brave new industry than the technology that gets us to space and benefits from it commercially..."

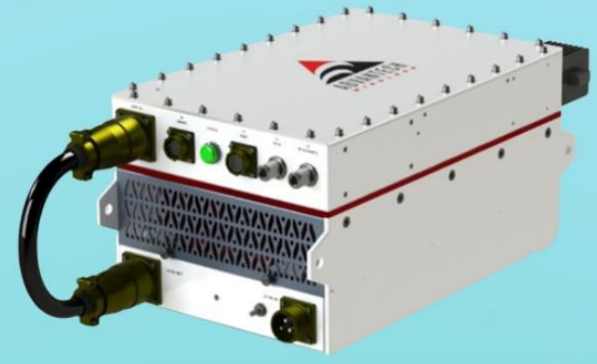
As our industry fills up Space with debris and figures out ways to create a circular economy instead (see the New York Space Business Roundtable with former Apple star and Privateer president Alex Fielding along with the hot new start-up company Astroscale https://youtu.be/8QEH37R_9tc on the subject) it is also revealing its depth, ingenuity and embracing Space as an increasingly integral part of evolving human nature.

Thanks to these three adventuring people and so many others we merely humans are putting our unique, evolving psyche into the once seemingly benign substance of Space.

Are Angels watching our every move as we go down the road less travelled? I guess we need to ask Brother Guy!

Lou Zacharilla is the Director of Innovation and Development of the Space and Satellite Professionals International (SSPI) and the host of the "Better Satellite World" podcast. He can be reached at: LZacharilla@sspi.org

ADVANTECH
WIRELESS
A Baylin Technologies Company



Introducing ***GENESIS*** - the new series of Ku-band SSPAs and BUCs from Advantech Wireless Technologies.

GENESIS epitomizes the latest in hardware and software technologies, making it the most feature-rich satcom SSPA in the industry. Initially available in 200W, and 250W variants, GENESIS delivers a host of high-end features, including some that are unique to the ***GENESIS*** family:

· Secure SNMPv3 interface
· Modular construction – fast production & simple serviceability
· Full M&C capability with embedded Webserver
· Field-removable power supply and fans
· Forward and reflected power monitoring & true RMS power detection
· Device-level monitoring for detailed fault analysis and diagnostics
· Embedded logic to manage multi-amplifier redundant and phase-combined systems, negating the need for any external controllers.

Additional frequency bands and higher power levels based on the ***GENESIS*** platform will become available in the coming months.

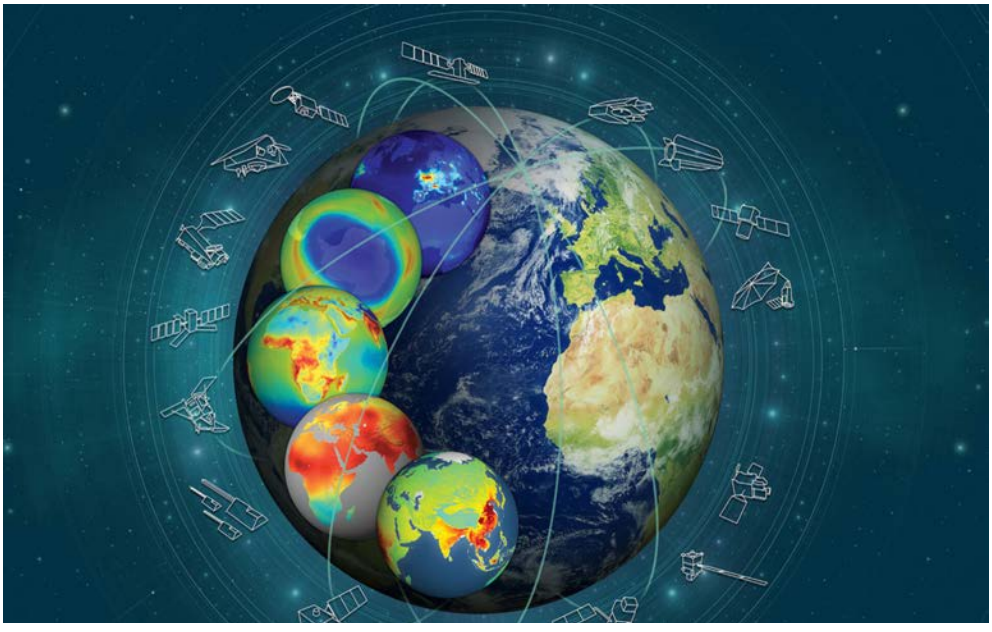
IBC2023

BACK AT THE
RAI AMSTERDAM | **15-18 SEPTEMBER 2023**

EO Opportunities for Biodiversity Monitoring

Rotoiti, a space consulting firm, interviewed several spectrum management experts. This brief describes the potential for Earth observation data to support biodiversity impact monitoring, as well as difficulties firms may face when developing related EO data-based products. This brief is based on discussions with experts at the intersection of biodiversity and EO.

There is growing pressure on market actors to report their biodiversity impacts. Increasing awareness of humanity's impact on biodiversity is leading to growing general concern about this issue. In response, governments and other organizations are developing rules and regulations to minimize biodiversity impacts. Market actors are experimenting with different ways to report on and minimize their biodiversity impacts, and biodiversity impact reporting is becoming more common in environmental, social, and corporate governance (ESG) reporting.



- One notable initiative is the Convention on Biological Diversity. At its most recent conference, COP 15, delegates committed to "30 by 30" – protecting 30% of land and 30% of coastal and marine areas by 2030. Another notable project is the Taskforce on Nature-Related Disclosures (TNFD), an international initiative developing a risk management and disclosure framework regarding "nature", defined as "the diversity of living organisms… and their interactions among themselves and with their environment".

Today's biodiversity impact reporting initiatives are mostly voluntary, but ultimately they will likely be superseded by reporting requirements and credit trading schemes. To date, voluntary initiatives are numerous and disparate. But ultimately, they will likely consolidate. And when consolidation occurs, this will enable impact reporting requirements with which market actors can comply. Authorities that will likely impose such requirements are governments and financial institutions. Requirements will in turn probably lead to imposed limits on net biodiversity impact per market actor, spurring the creation of biodiversity impact credit schemes.

Much of the narrative about biodiversity reporting conceptualizes it as "emissions reporting 2.0". Climate, like biodiversity, is an Earth system-level environmental issue that is being significantly affected by human activity. Though it took time, a dominant narrative ultimately emerged that carbon dioxide emissions are a key indicator of individual market actors' impact on climate. Consensus about this indicator led to reporting requirements regarding carbon dioxide emissions and paved the way for trading schemes. Many believe biodiversity impact reporting is following a similar trajectory as emissions reporting, though at an earlier stage of development.

- Many biodiversity impact reporting initiatives take cues from emissions reporting initiatives. TFND, for instance, is modeled on

the Taskforce on Climate-Related Financial Disclosures (TCFD). Moreover, for many of the firms that are developing products and services to monitor biodiversity impact, they also work on emissions monitoring.

Earth observation data plays a critical role in emissions reporting and credit trading schemes, and it seems likely to play a similarly important role in biodiversity monitoring. For both climate and biodiversity, it is important to be able to see each phenomenon on a global scale, and sensors on satellites are in a unique position to collect such information. To be clear, EO data does not supplant the importance of other data sources. But it allows data from many sources to be weaved together into grand narratives about human activity's effect on the Earth system.

There is significant excitement about the business potential of developing EO data-based products and services to monitor biodiversity impacts. Though it may not be readily apparent to outsiders, when one delves into this business area it quickly becomes clear that a "rush" is occurring – many firms are spending significant effort to develop such products and services. The firms doing this are various – firms of different sizes (e.g. startups and multinationals), firms with different emphases (e.g. geospatial, financial, or ecological), and firms in different markets. As is the case with any rush, it seems likely most of these firms will fail. This rush seems to be premised on two beliefs: 1) developing such tools is morally important and improves the sustainability of humanity's relationship with the Earth system; and 2) there is a significant amount of money to be earned by developing such tools, since it appears there will shortly be high demand for them.

"...EO data expertise alone is insufficient; to create useful products that overcome the difficulties described in this brief, product developers should incorporate data from other sources and collaborate with individuals who have expertise in relevant fields..."

The difficulties facing EO data-based biodiversity monitoring

Several issues problematize EO-based biodiversity monitoring, first and foremost: it is unlikely that a single "king metric" will emerge for biodiversity as has happened for climate. Carbon dioxide emissions have become the "king metric" for measuring market actors' impact on climate. It seems improbable that any single metric will be similarly used to measure biodiversity impact. There are many views (some of which oppose each other) on why biodiversity resists simplification, including: "biodiversity" is a term whose very definition is subject to debate; biodiversity can be measured at various levels (e.g. genes, species, and biomes); the complexity of biodiversity resists forecasting; and the perceived value of biodiversity depends greatly on the circumstances (e.g. an "invasive" species in one context is an "endangered" species in another).

- Most experts agree that biodiversity impact is unlikely to be reduced down to a single market actor-level indicator as carbon dioxide emissions has emerged for climate impact. More viable is a suite of biodiversity indicators, a subset of which will be used in any particular context. The so-called "essential biodiversity variables" (EBVs) is one prominent conceptualization of such a suite-of-indicators approach. The Group on Earth Observations Biodiversity Observation Network (GEO BON) is developing 20 such EBVs.
- The lack of consensus about relevant indicators – or more accurately put, about simplified indicators which readily inform market actors' decision-making – poses a risk to firms developing products or services defined by certain indicators: if their preferred indicators turn out to have little currency, then those firm will have wasted their time and money.

Firms working on EO data-based biodiversity monitoring should be aware of three issues that pose reputational risk: controversial outcomes; faulty credits; and exacerbation of inequality. All three of these issues, which are in fact intertwined, mar satisfaction with today's emissions credit schemes. It is entirely probable that these issues could similarly mar satisfaction with future biodiversity credit schemes. Companies associated with these issues (e.g. those perceived as exacerbating inequality) face the prospect of reputational blowback and business difficulties.

- **Controversial outcomes:**

Creonic is an ISO 9001:2015 certified provider of ready-for-use IP cores for

- **wireless,**
- **wired,**
- **fiber and**
- **free-space optical communications.**

The products are applicable for ASIC and FPGA technologies and comply with the highest requirements with respect to quality and performance.

CONTACT

Creonic GmbH
Bahnhofstraße 26-28
67655 Kaiserslautern
Germany

Phone: +49 631 3435 9880
Mail: sales@creonic.com
www.creonic.com

IP CORES

- **Modulators and Demodulators**
- **Encoders and Decoders (LDPC, Turbo, Polar, RS, BCH, ...)**

Creonic offers the largest portfolio of IP Cores on the satellite communications market and covers the most important standards:

DVB · CCSDS Consultative Committee for Space Data Systems · IEEE Carleton University · 3GPP A Global Initiative

IP SERVICES

- **Off-The-Shelf** IP Cores
- **IP Core Customization** for individual needs
- **IP Core Developement** according to customer's requirements
- **System Integration** on customer's platform

Credits do not incentivize market actors to reduce their impact, but simply to reduce their net impact. For emissions, this means a firm may, for example, keep emitting a significant amount of carbon dioxide but simply pay someone else to not cut down trees that were going to be harvested. For biodiversity, a parallel scenario would be a firm killing a species in one ecosystem but paying to preserve a species elsewhere.

• **Faulty credits:** There are many doubts about emissions credits in terms of whether they are in fact "as advertised". For emissions, for instance, common questions are: Was there hype about what logging's impact would have been without intervention? Did the decision to not cut down trees result from incentives created by credit schemes?

• **Exacerbation of inequality:** A common view is developed countries are disproportionately responsible for human-caused changes to the Earth system. And reporting requirements and trading schemes add costs to doing business and also present opportunities to generate wealth. So, if poor countries bear a disproportionate amount of the new added costs of doing business, and if rich countries earn a disproportionate amount of new wealth generated from impact monitoring, then this is seen as unfairly exacerbating inequality between countries (and destabilizing the international system).

Besides the above issues, firms developing EO-based biodiversity monitoring products will also face all the more general difficulties that bedevil firms developing a wide variety of EO data-based products. EO sensors provide a wide variety of data in terms of the type of imagery (e.g. SAR, optical, hyperspectral). They moreover vary in terms of temporal and spatial resolution and in terms of the extent to which they are pre-processed. All of this variation makes it difficult to blend data from different sources. Licensing requirements for different data sources also raise costs and make it difficult to have unfettered access to the best combinations of data sources.

Lastly, EO data expertise alone is insufficient; to create useful products that overcome the difficulties described above, product developers should incorporate data from other sources and collaborate with individuals who have expertise in relevant fields. Whatever the consensus is about which indicators matter, data for those indicators will almost certainly come from multiple sources. There will continue to be value in boots-on-the-ground fieldwork and aerial surveys, for instance. There is also a variety of emerging technologies that may provide useful data – eDNA and bioacoustics, for example. And whatever combination of sources provide the data, expertise in various fields (e.g. ecology and finance) will be necessary for translating the data into scores that allow for comparing various market actors' impacts. Such comparability is crucial for market actors – it lets them plan how to compete and how to comply with regulations.

Rotoiti provides market research, strategic advisory, and business development services. Clients are company executives, government policymakers, and academic researchers. Rotoiti focuses on the Asia-Pacific and works in all segments of the space industry. For more information go to: www.rotoiti.space

CommunicAsia

ND SATCOM Booth 4H2-14

www.ndsatcom.com

Spotlight on key products to be showcased at Satellite Asia 2023
Singapore, June 7-9, 2023

Advantech Wireless

visit Advantech Wireless at the Quebec, Canada Pavillion Hall 3 booth # 3 M4-01

Advantech Wireless, an ISO 9001: 2008 certified corporation, is shaping the world with leading-edge wireless broadband communications. Since 1988, Advantech Wireless manufactures and deploys networking solutions for broadband connectivity, broadcast solutions and backhaul requirements using satellite and terrestrial wireless communications. Products include: Terrestrial Microwave Radios, Antenna Controllers, Deployable Antennas, SSPA's, Block-up Converters, Frequency Converters, Ruggedized Routers, Satellite Modems and VSAT (DVB-RCS) Hubs & Terminals.

For more information go to: www.advantechwireless.com

Comtech

visit Comtech at Hall 5 booth # 5 C3-01

Comtech is a leading global provider of satellite and space communications and terrestrial and wireless network infrastructures to commercial and government customers around the world. Headquartered in Melville, New York and with a passion for customer success, Comtech designs, produces and markets advanced and secure wireless solutions.

At Satellite Asia, Comtech will be showcasing its Elevate Hub--a Multilayered, Multi-Orbit Hybrid Architecture designed to be fully integrated with LEO/MEO/GEO space traffic orchestration. Equipped with a powerful new NMS, the Comtech ELEVATE Hub is able to coordinate high traffic over multiple LEO Satellites, while dynamically controlling Doppler effects, bandwidth allocation, and adapting to each satellite or beam specific power density requirement. Comtech ELEVATE provides constant search and lock guidance to both hub and remote antennas, by using Comtech's new ACU algorithms.For more information go to: www.comtech.com

Integrasys

visit Integrasys at Hall 5 booth # 5 G1-08

Integrasys is a privately owned company specializing in engineering and manufacturing of Satellite Spectrum Monitoring Systems, VSAT Installation & Maintenance, and Link Budgets in the satcoms and broadcasting markets. Integrasys has been leading for 30 years the innovation in the satellite industry with new solutions which saves time, effort, and OPEX for satellite industry companies. At Integrasys our mission is to provide the industry with the best quality and fastest technology available in carrier monitoring systems, with the customer service and care that our customers deserve.

Combines Satellite RF and IT engineering expertise with the new AI, Data Science, and Learning Machine innovations for providing success through constant innovation. Best Partners and largest companies in the satcom industry. Global Presence from Alaska to New Zealand. Excellent post-sale support and warranty programs guaranteed.

Smarter, easy to use and cost-effective tools for smarter satellite operators and service providers.

Ensure purchasing the right provider that You can count on!

For more information go to: www.integrasys-space.com

PRODUCT SPOTLIGHT

Flyaway and Maritime Antennas from JONSA Technologies

visit Jonsa at Hall 5 booth # 5 F2-03

Jonsa Technologies from Taiwan is a trustworthy manufacturer of communication antennas, and our monthly production capacity has been over one million in a variety of antenna products. We are waiting for the new partner who will cooperate with us and create a win-win situation together.

Our best-selling product in Jonsa includes:

0.6M/0.9M Auto and Manual Flyaway

- Ring focus antenna with 8 segments reflector
- Support Ku and Ka band as an option
- Carbon fiber reflector with light weight, high strength and one person can finish the installation within 3 minutes.

VSAT (E74/97/120) antenna

- Customized VSAT antenna products
- Correspond with electronic devices, such as integrated LNB and Feedhorn
- Support Ku and Ka band as an option

0.6M/0.9M Ka and Ku band Maritime with radome

- One-touch commissioning
- High gain and carbon fiber antenna
- Support beacon receiver, DVB, and digital tracking system

For more information, please visit **www.jonsa.com.tw** or email **saccount@jonsa.com.tw**

ND SATCOM: The future is Now. The Future is SKYWAN 5G

visit ND Satcom at Hall 4 booth # 4 H2-14

With over three decades of experience, **ND SATCOM**, headquartered in Germany, is the premier supplier and integrator of innovative satellite communication systems and solutions to support customers with critical operations around the world. Customers in more than 130 countries have chosen ND SATCOM as a trusted and reliable source of high-quality, secure turnkey and custom system-engineered communication solutions. The company's products and solutions are used in more than 200 transnational networks in government, military, telecommunications and broadcasting sectors. The flagship of ND SATCOM, the SKYWAN platform, enables international users to communicate securely, effectively and quickly over satellite. ND SATCOM's core technologies and diverse applications are: • SKYWAN, an advanced MF-TDMA VSAT system for establishing wide area networks for military, governments and enterprises. • FlyAway antennas for various commercial and military uses. • Tactical Communication-On-The-Move (COTM) for high-security missions on land and sea, enabling mobile command and control. • Tailored communication solutions for embassy networks, disaster relief and emergency operations, oil and gas explorations, and maritime locations. • Leading supplier of ATC networks across the globe. • Specialized solutions for military and defence operations such as mobile and transportable satellite ground terminals.

Dive into a new dimension of satellite communication with SKYWAN 5G. Just when you thought you heard it all – from reliability to flexibility to scalability – **ND SATCOM** breaks the barrier with new engineering features that anticipate your business needs and further optimise the performance of your business. We listen, we innovate, we lead. This is why our standards of excellence, proven track record and 5th generation SKYWAN keep customers coming back for more. We are the only trusted solution provider in Europe for demanding market sectors such as aviation and the military, where the concept of reliability has far-reaching impact. For more information, go to: www.ndsatcom.com

Mission Microwave

visit Mission Microwave at the Sat-Lite booth at the US Pavillion, Hall 5 booth # 5 H2-07

Mission Microwave Technologies was founded in 2014 to create the next generation of Solid-State Power Amplifiers (SSPAs) and Block Upconverters (BUCs). We use advanced GaN transistors, unique power combining technology, and novel full-system designs to create the industry's most efficient, lightweight, and compact high-reliability SSPAs for mobile communications applications.

Mission Microwave supports the satellite terminal industry with high performance X-, Ku-, and Ka-band products from highly integrated transceivers in the 10-80 watt range to large-scale amplifiers up to 400 watts for gateway installations. Customers rely on Mission Microwave to provide the highest level of capability, reliability, support, and on-time delivery.

Mission Microwave X-, Ku-, and Ka-band GaN BUCs

For more information, go to: www.missionmicrowave.com

Revgo Global

visit Revgo Global at Hall 5 booth # 5 H1-08

RevGo Global Inc. was founded by senior satcom executives from US and Canada with more than 100 years of combined experience at Satcom RF system design. We combine the new generation GaN technology with unique power combining capabilities, designed for high volume production with strict reliability and quality control to create the most compact, cost-effective, field-proven, reliable BUCs, LNBs and Transceivers. Manufactured to the stringent quality standards of ISO9001:2015. All at the highest value available and the shortest lead times.

For more information go to: http://www.revgotech.com/

RF-Design

@Satellite Asia contact Oliver Vogel at o.vogel@rf-design-onine.de

25 YEARS ANNIVERSARY

...designed for perfect signals

For 25 years **RF-Design** has been developing, manufacturing and marketing technology leading satellite ground segment products and solutions offering a wide range of premium class RF-distribution, RF-over-Fiber, RF amplifying and RF monitoring systems. High quality products, long expertise, flexibility and the ability to customize products for individual customer requirements along with an unique customer oriented service approach have made us an reputable partner within this sophisticated industry around the globe.

Celebrate our 25 years anniversary with us iat Satellite Asia and learn more about our latest RF Switch Matrix systems, RF-over-Fiber, RF amplifier and RF monitoring products.

We look forward to meeting with you soon in Singapore.

For more information, go to:
www.rf-design-online.de

rf DESIGN

25 YEARS ANNIVERSARY

Excellence in RF Equipment

ATX SG SatelliteAsia

Meet with us at
Expo Singapore
June 06 - 09, 2023

...designed for perfect signals

RF Switch Matrix Systems

RF-over-Fiber Solutions

RF Line Amplifiers

RF Monitoring Systems

- Unique – Innovative – Clever RF Switch Matrix Systems
- RF-over-Fiber Solutions for Indoor & Outdoor Applications
- Line Amplifiers (Single, Dual, Quad, 1+1 & N+1 Redundant)
- Innovative & Unique RF Monitoring Solutions
- Single & Quad Redundancy Switches
- Active Splitters & Combiners
- Custom Made Products and Solutions

Satservice GmbH

visit Sateservice at the Calian booth at the US Pavillion, Hall 5 booth # 5 G1-01

SatService GmbH, a designer, manufacturer and reseller in the field of satellite communications, specializing in ground station and teleport equipment. We are pleased to present the latest technologies and our very own sat-nms products, at this year's Cabsat show. Designed & manufactured in Germany, SatService provides competitive and customer dedicated products as well as system solutions with high quality and quick reaction time. Our strength is the combination of system engineering and integration know-how with highly sophisticated products.

Our sat-nms product line consist of Monitoring & Control, Network Management Systems, Motorized Antennas and Antenna Tracking Systems, Beacon Receivers, Distribution Amplifiers, Matrixes, Converters and Fiberoptical Links.

SatService is your reliable and innovative Partner in the field of satellite communications.
For more information, go to: www.satservice.gmbh.de

Terrasat Communications

visit Terrasat at the US Pavillion, Hall 5 booth # 5 H2-01

Terrasat Communications, a privately-owned US company, has been manufacturing microwave & satellite RF equipment since 1994. We started with custom engineered microwave RF modules & Block UpConverters (BUCs). Today, we produce the most innovative BUCs on the market; the IBUC–the Intelligent BUC. Unlike the typical BUC, the IBUC includes multiple sensors and a powerful micro-processor for performance improvement & feature enhancements. All IBUC models include a web interface for extensive Management & Control and are SNMP-compliant for easy interface with any NMS. IBUC models are available in C-band, X-band, Ku-band, & Ka-band with a full range of output power levels. Our higher-powered models incorporate GaN amplifier technology to optimize performance with minimal back-off to the PLinear point & deliver maximum usable power. The Engineers product of choice.
For more information go to: www.terrasatInc.com

WORK Microwave

visit WORK Microwave at the German Pavillion, Hall 4 booth # 4 H2-07

Headquartered in Holzkirchen, Germany (near Munich), and comprised of four operating product lines —Satellite Communication, Navigation Simulators, Defence Electronics, and Sensors and Measurement — **WORK Microwave** leverages over 35 years of experience to anticipate market needs and apply an innovative and creative approach to the development of its technologies while maintaining the highest standards for quality, reliability, and performance. WORK Microwave's Satellite Communication product line develops and manufactures high-performance, advanced satellite communications RF- and optical ground segment hardware and software for earth observation, NGEO constellations, direct-to-home broadcast, IP networks, teleport management, government communications, and many more applications.

What's your Mission?

At **WORK MIcrowave,** we have the solution. Our mission is to help your data to cross the edges between Space and Ground. RF and digital. Optical and digital. Virtual and hardware on your ground station. We develop ground segment equipment for any of your mission.
For more information, go to: www.work-microwave.com

Path to the Good Life

On the banks of the Amazon River in Equador lies a village called Puerto Salazar. Though small, the village does have a school, and one day Franciso Licuy arrived to be its teacher. He was still one semester short of completing his university studies. It looked like he might not get the chance, because the village had no internet access.

Then a friend told him about something called HughesNet, which could bring him the internet by satellite. He arranged an installation. Soon, he was finishing his final semester online – and introducing students to the educational wealth of the world wide web.

Education is the Key

For the eight billion people on planet Earth, in rich countries and poor, education is the key to a good life.

In the world's rich nations, the average high school student who drops out before graduating will earn less than half what a college or university graduate makes.

The gap is even bigger in emerging economies. In Peru, a high-school graduate makes only one-third the income of a graduate from university.

But without access to the internet, a quality education is hard to come by. In Latin America, broadband reaches only half as many subscribers as it does in North America and Europe.

That gap denies students the education they need for today's jobs, and robs businesses of the skilled people their success should depend on.

Companies like Hughes are doing something about it, connecting millions of people to the internet with satellite.

Cities Falling into the Broadband Gap

Remote villages are not the only places falling into the broadband gap. Callao is Peru's chief seaport and airport. It borders Lima, the nation's capital – but none of its eleven high schools had internet access. Frustrated parents bought pre-paid cellphones just so their children could go online. HughesNet service installed at each school changed everything.

The schools downloaded educational content to their computers, and students and staff connected to it through Wi-Fi. Without the expense of individual internet accounts, the students gained access to 60,000 books on over 25 million topics, refreshed regularly from internet downloads.

The same story is playing out in Mexico, Brazil, Chile and Peru. Through innovators like Hughes, the smart use of satellite is bringing schools online that might never have gained access, at a cost that governments in these nations can afford. And that is bringing the good life closer for billions of people.

Gilat Signs Definitive Agreement to Acquire DataPath

Petah Tikva, Israel, March 9, 2023 - Gilat Satellite Networks Ltd. (Nasdaq: GILT, TASE: GILT), announced that it has signed a definitive agreement to acquire DataPath, Inc. (DPI), which will be a core component of Gilat's Defense growth strategy. DataPath is a provider of trusted communications for the US DoD Military and Government sectors. The acquisition is another step in Gilat's initiative to increase its presence in the growing Defense market. Gilat expects its annual revenues in the Defense sector to increase by approximately US$ 50 Million following the closing of the acquisition, accoridnign to the company.

The transaction has been approved by the Gilat board of directors and by DataPath's board of directors and stockholder. The closing of the transaction is subject to certain regulatory approvals, including the receipt of clearance of the Committee on Foreign Investment in the United States (CFIUS), and other customary closing conditions. The acquisition is expected to close in the third quarter of 2023.

DataPath has more than 25 years of experience in integrated communications and information technology and is a market leader in trusted communications systems, services, and end-to-end solutions for mission-critical operations. DataPath is a US based expert systems integrator with a strong focus on the DoD and US government sectors, bringing leading competencies in systems engineering, software development and mechanical engineering. These attributes have enabled DataPath to secure and maintain their continual presence in the provision and sustainment of SatCom systems, such as portable ground stations, and related services.

Needham & Company LLC and Quilty Analytics LLC are serving as financial advisors to Gilat. Naschitz Brandes Amir & Co. and Foley and Lardner LLP are acting as Gilat's legal counsel. RCBG is serving as an exclusive financial advisor to DataPath. DLA Piper LLP and Greenberg Traurig are acting as DataPath's legal counsel.

Voyager Space Acquires ZIN Technologies

London, UK, March 15, 2023 - Voyager Space, an American space technology company announced the acquisition of ZIN technologies Inc. (ZIN), an engineering, design and integration company providing human-related spaceflight systems and monitoring solutions. This acquisition is part of Voyager Space's expansion of space infrastructure and technology capabilities to further its Starlab development efforts.

ZIN provides systems and highly engineered solutions to multiple launch vehicles, low-Earth orbit infrastructure projects, and spacecraft, including the U.S. Space Shuttle, the MIR space station, the International Space Station (ISS), Dream Chaser, and Starlab. ZIN has participated in over 400 research activities on the ISS – including the development of microgravity research equipment, and supporting the human-rated structural monitoring systems for the Lunar Gateway under NASA's Artemis program.

ZIN has experience in the integration of complex space-rated hardware and the development of rendezvous, docking, and related capabilities. These solutions have direct applications to the Starlab space station and complement Voyager Space's portfolio of space infrastructure and technology capabilities.

"ZIN's aerospace expertise, strong reputation in the industry, and legacy working with NASA and the ISS, makes them a perfect fit for Starlab and the growing Voyager Space technology ecosystem," said Matthew Kuta, President and COO of Voyager Space. "ZIN has already played a crucial role as a capability provider to Starlab and as a founding leadership team member of the George Washington Carver (GWC) Science Park. We look forward to working with them further as part of the Voyager Space family."

ZIN technologies is the seventh acquisition by Voyager Space since January 2020 and is their largest acquisition to date.

AVIA's flagship conference of the year, the Asia Video Summit, is delighted to be returning to Hong Kong, bringing all the different ecosystems within the video industry together for this event.

Join us as we explore these key themes and more:

- **The State of Video 2023**
- **The Making of Korea and the Model for Who's Next?**
- **Video at the Crossroads**
- **Technology Taking Over**
- **The Advance of Advertising**

Visit www.asiavideosummit.com for more details. **REGISTER NOW**

Gold Sponsor

INVIDI™

Silver Sponsors

AsiaSat

broadpeak
This is streaming at its peak

FRANCE 24

Magnite

measat

NAGRA KUDELSKI

Bronze Sponsor

Dolby

For sponsorship opportunities, contact: adela@avia.org

For registrations and other enquries, contact: vanessa@avia.org

ST Engineering iDirect Announces Strategic Leadership Appointments President

Herndon, VA, May 2, 2023 - ST Engineering iDirect announced four new strategic appointments, as the business strengthens its global leadership team.

Tim Verschage, a satcom industry veteran, has been appointed as Senior Vice President of Product Strategy and Development. He will concentrate on ensuring that ST Engineering iDirect technology is aligned in a way which fast-tracks innovation to meet a variety of new satellite applications. Previously Director of Business Development at Intelsat General Corporation, Verschage brings over 30 years of experience in engineering, systems integration and product and program management.

Emma Park has been appointed as Senior Vice President of Market and Growth Strategy, and will redefine the company's go-to-market strategy in response to the evolving and dynamic market and customer requirements. Park brings over 25 years of experience in sales, business development and strategy in telecommunications, satellite and IoT.

Dean Buckley has been appointed Chief Operating Officer, and will be laser focused on customer-centricity ensuring execution and committed delivery of the company's products and solutions. In his 18 years with the company, Buckley has managed several of its key operational and customer-facing teams and has been responsible for positioning the company for scalable growth.

Julie Bettinger has been appointed as Chief Marketing Officer, having led ST Engineering iDirect's marketing team for nearly two decades. Bettinger will be focused on strengthening ST Engineering iDirect's brand positioning and will also play a critical role in continued strategic engagement with customers and the market.

In their new positions, these industry experts will support recently appointed CEO Don Claussen and the rest of the executive team, in leading the company in expanding its global leadership and technology vision against a backdrop of rapid satcom industry transformation.

Don Claussen, CEO of ST Engineering iDirect, said, "We are delighted to have Tim and Emma join our senior leadership team, as well as Dean and Julie moving into their new roles. With their strong credentials and a wealth of industry experience, they will be instrumental in planning and delivering ST Engineering iDirect's future vision."

Clockwise from left: Tim Verschage, Emma Park, Julie Bettinger, Dean Buckley

Charlotta Sund Appointed CEO of SSC

Solna, Sweden, May 4, 2023 - The Board of **Swedish Space Corporation (SSC)** has appointed **Charlotta Sund** as the new President and CEO of the SSC Group. She will take office during the autumn of 2023, and succeeds the current CEO Stefan Gardefjord who retires after twelve years in the company.

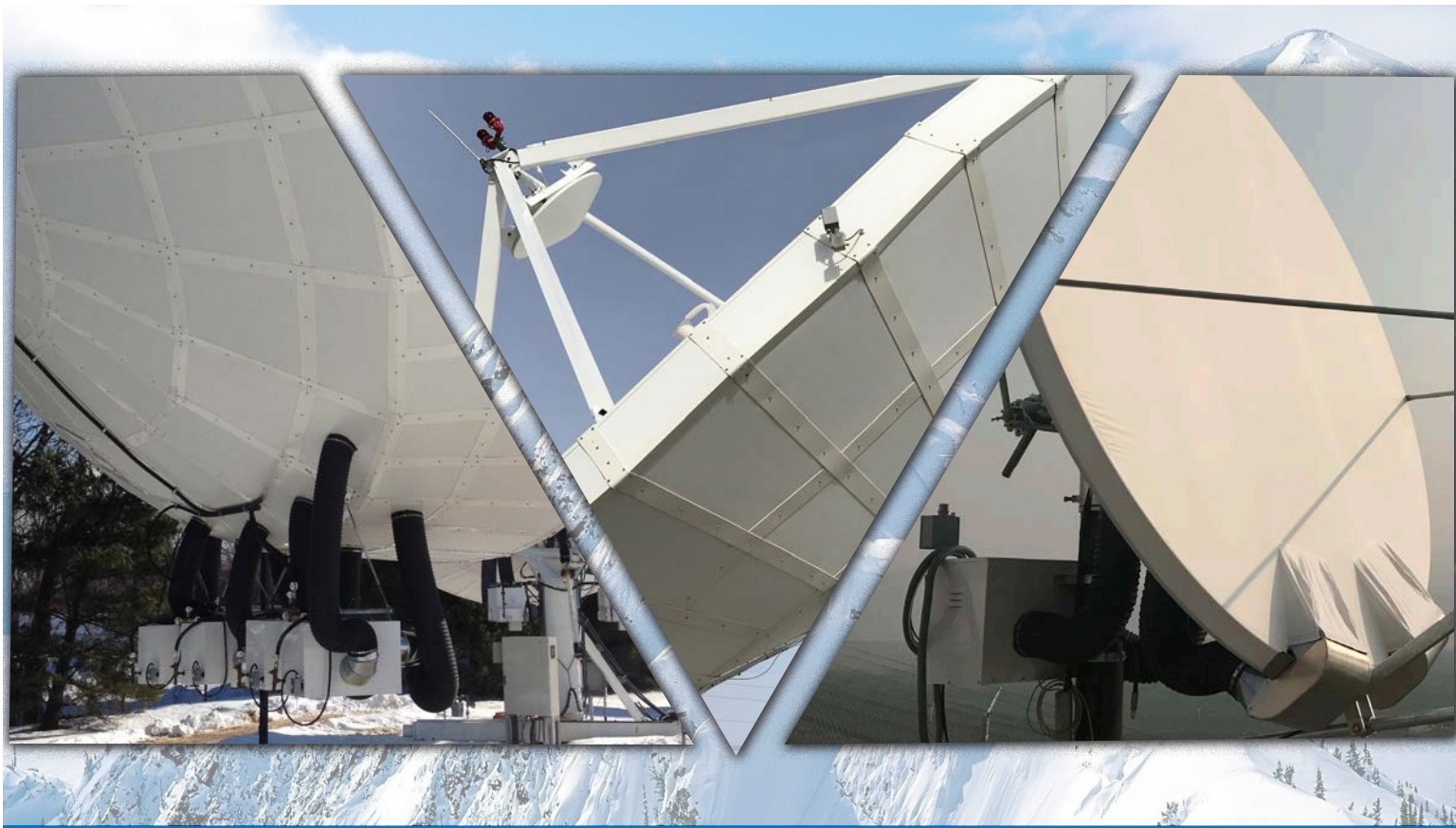
Since 2018, Sund is the President and CEO of Tekniska verken in Linköping, an industrial group tasked by regional community owners with creating resource-efficient energy systems for a sustainable society. There, she has led the organization through times of change, during the current energy crisis, as well as adapted to new regulations and expectations from both private and commercial actors on sustainable, safe and secure services.

Her background also includes a vast experience from Ericsson, a global telecom group where she held several senior positions. From this period of her career, she brings a customer focused mindset and deep knowledge on how to integrate sustainable innovation into the core business and use it as a tool to attract new customers.

Sund will officially take office during the autumn of 2023, according to an agreement between the SSC Board and the retiring CEO Stefan Gardefjord.

Protect Your
Earth Station Antennas
From Ice, Snow, Rain, and more

WALTON DE-ICE



Antenna De-Ice Systems:

- **HOT AIR**
- **Ice Quake**
- Snow Shield
- Portable Radome

Walton Advantages:

- Uniform surface heating
  - **Minimizes reflector distortion loss**
  - Maximizes accuracy
- Most powerful and cost-effective system on the market
- **40+ years field-proven technology**
- 24/7/365 Support & Field Services

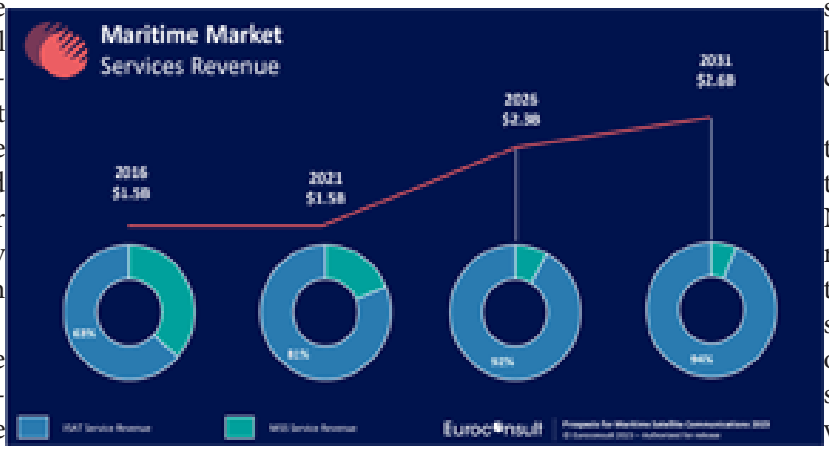
Trust The Experts in De-Icing Solutions

+1 (951) 683-0930 | sales@de-ice.com | www.De-Ice.com
W.B. Walton Enterprises, Inc. P.O. Box 9010 San Bernardino, CA 92427, USA

Visit us at:
EMPOWERING CONTENT EVERYWHERE
Sept. 15-18, 2023
RAI Amsterdam

Maritime Bandwidth Capacity Demand Set to Increase Twentyfold by 2032

Paris, France, May 4, 2023 -=With the most serious restrictions of COVID-19 now generally in the rearview mirror, leading market intelligence firm Euroconsult estimates that maritime connectivity sectors have mostly recovered from the pandemic's influence on supply chains and vessel activity at the end of 2022. According to Euroconsult's forecasts, maritime satellite communication operators are expected to surpass US$ 1.1 billion in revenues by 2032 at a 7% CAGR over the decade. Though some service providers will see a fall in their average revenue per unit (ARPU), total service revenues are expected to grow at a similar CAGR, falling slightly short of US$3 billion by 2032.



In the latest release of its annual "Prospects for Maritime Satellite Communications" report, Euroconsult caveats the findings by warning that low-bandwidth services, predominantly for small merchant and fishing vessels, have not escaped the impact of the rising influence of inflation either and have seen an increase in data plan pricing. The report also makes reference to the war in Ukraine, which has led to geo-political effects on sectors like Offshore Oil and Gas, resulting in an increase in the number of support vessels being deployed to deal with demand-supply challenges.

High-bandwidth prices adhered to the expected downward trends for 2022, as accurately predicted in the company's previous edition of the market intelligence report. This was particularly reinforced by the entrance of non-geostationary orbit (NGSO) constellation services, especially from Starlink, following SES's O3b mPOWER, with OneWeb expected to join them in 2023/24.

"Starlink's introduction created some waves in the market, especially in the latter half of the year, receiving a mixed reception," says Vishal Patil, Senior Consultant at Euroconsult and Chief Editor of the report. "Whilst less cost-sensitive markets such as offshore rigs, large cruises, and leisure operators embraced it with open arms, small to medium merchant and fishing vessels remain watchful and are anticipated to trial out multiple services onboard before choosing the most suitable."

Euroconsult estimates that the launch of maritime NGSO services is driving the adoption of very-small-aperture terminals (VSATs) in the sector, with 37,000 VSAT-equipped vessels at the end of 2022, the merchant shipping segment leading with 23,000 crafts.

After analyzing the initial response to the launch of new NGSO services, Euroconsult forecasts that the passenger segment will be hot on the tail of offshore and leisure verticals in adopting new communication technologies, with Starlink in particular seeing a positive response some other segments as well.

The firm thus expects a total of 90,000 VSAT-equipped vessels by 2032, with the associated bandwidth usage to grow twentyfold in 10 years from 65 Gbps in 2022 to 1.3 Tbps, mainly driven by the increased adoption of VSATs influenced by the availability of NGSO services for the maritime market.

"The cost of capacity will continue to fall given the increased supply provided by the new generation of geostationary very high throughput satellites (GEO VHTS) and NGSO satellites, pressurizing existing capacity providers also to lower prices," added Patil.

Euroconsult's "Prospects for Maritime Satellite Communications" report provides a review of key metrics of the Maritime Connectivity systems and services market, with a focus on satellite technologies, the impact of NGSO constellations, smart ships, and autonomous vessel concepts. The report contains a Strategic Outlook of global trends and forecasts by region and technology and is now available for order from the Euroconsult Digital Platform.

INTEGRASYS

Smart Tools for End-to-End Technologies with AI for SatCom, and Defense

Buy/Sell,
Design & Manage

Deploy &
Monitor

Capacity
Management

Interference
Mitigation & Removal

REQUEST YOUR DEMO
BOOTH 5G1-08

ATX CommunicAsia

integrasys-space.com info.sales@integrasys-sa.com @IntegrasysSA Integrasys SA and LLC

ADVERTISERS' INDEX

WORK MICROWAVE

Meet us at CommunicAsia
Booth number 4H2-07 at German Pavilion,
June 7-9, Singapore

What's your mission?
We have the solution.

Our mission: Help your data to cross the edges between Space and Ground.

Any state-of-the-art technology:
Optical and RF.
Virtual ground station or hardware.

New Space

Deep Space

Governmental

Communication

We develop ground segment hardware and software for any of your mission.

Tell us about your mission!

WORK Microwave GmbH, Germany • www.work-microwave.com