AARSE

African Association of Remote Sensing of the Environment
Association Africaine de Télédétection de l'Environnement

NEWSLETTER • AUGUST 2019

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From the Editor

Africa has a lot of problems which mostly have to do with bad management that resulted in crippling poverty, overuse of natural resource such as wiping out forests for firewood and uncontrolled poaching which has put many animal species on the endangered list. But compare Africa for a moment to the heavily industrialized countries in the Northern Hemisphere. What happened to the great forests that covered most of Western Europe and the magnificent herds of bison that once roamed North America? They are forever gone, all because of unplanned human intervention.

Fortunately Africa is not an over-industrialised continent. Although many things on our continent are hanging on by a thin thread, there is still hope. Many bad situations can still be reversed. We can fight back and are doing exactly that. This is where the possibilities of Earth Observation Systems and Geo-information Technology kick in. We now have tools available with which to overcome the limiting effects of vast distances and lack of infrastructure in Africa. Suddenly the challenges we face in the arena of urbanisation, deforestation, wild-life and marine protection, agriculture and natural disasters are not completely unsurmountable if we go cleverly about applying this new technology.

This brings me to the African Space Agency; a creation of the African Union under their Space Policy and Strategy which has now finally come to fruition and found a home in Egypt, their official headquarters from where it will operate. It was hard work on the side of the AU to get all the legal and organisational instruments in place, especially if you represent an entire continent. The African Space Agency now effectively has the backing of 55 countries and their main objectives and functions which we report on in this issue are daunting, but great things take time. Africa's outer space strategy is listed as one on the 14 Flagship Projects of the AU's Agenda 2063, the blueprint and master plan created for transforming Africa into a future global powerhouse. It is clear that the African Space Agency is destined to play a key role in accelerating Africa's economic growth and development.

We therefore wish the African Space Agency all the best and eagerly await announcements of their plans and progress. We are keen to cooperate where possible as I am sure every other modern thinking African would be.

Anthony Penderis

Editor

AARSE Membership Invitation

The primary aim of AARSE is to increase the awareness of African governments and their institutions, the private sector and the society at large, about the empowering and enhancing benefits of Earth Observation Systems and Geo-information Technology.

See 10 Reasons why you should join at http://africanremotesensing.org/why-join-aarse/

We have different rates for 7 categories of membership namely: Student; Regular (residing inside Africa); Regular (residing outside Africa); SMME; SMME with ARSGC Membership; Corporate; and Corporate with ARSGC Membership

See http://africanremotesensing.org/join-us/ for online payments.

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The AARSE Newsletter is published bimonthly and distributed electronically to a select audience consisting inter alia of the following: African national space agencies and governmental research centres; Academics and scholars at Africa's top universities; Africa space technology associations & organizations; Key personnel at inter-governmental space organizations; Satellite communication companies; Foreign Space Agencies involved in space activities in Africa; Astronomy Observatories and Institutions; Private Companies investing in space in Africa; Top space agencies worldwide i.e. NASA, ESA, UK, Japan, Germany, Canada, India, etc; and Editors of all the world's top satellite and space technology publications.

The newsletter will always be a minimum of 16 pages with content divided more or less as follows: AARSE News (25%); Africa Space News (50%); International Space News (25%); See samples of previous newsletters at http://africanremotesensing.org/current-newsletters/

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Message from the President

Dear Readers

With the editorial team, I am pleased once again to invite you to learn about some developments in the world of scientific activity and remote sensing in Africa and around the world in this August 2019 edition of the AARSE Newsletter.

In the arena of satellite and remote sensing in Africa hardly a day goes by without yet another new exciting announcement which could contribute to improving the lives of people on this great continent of ours. In this vein I thought it appropriate to announce that the 13th AARSE Conference is scheduled to be held next year from 26th to 29th October 2020 in Kigali City, Rwanda. We are currently in consultation with our organizing partners the INES-Ruhengeri Institute of Applied Sciences and the Rwanda Land Management and Use Authority (RLMUA) about the finer details and appropriate dates to announce our guidelines for paper submissions and call for abstracts.

The theme for next year's conference will be "Space and geospatial technologies for the Africa we want". This theme will of course cover the critical areas for development in Africa which are inter alia natural resources management, the effect of climate change on agriculture and food security, smart city development, natural hazard and disaster management, renewable energy and post-conflict land administration to name but a few.

As with our previous conferences the 13th AARSE Conference will provide a platform for policy makers, scholars, academics and private entrepreneurs to exchange views and inspire each other. At our previous conference in Alexandria, Egypt last year we had some 130 papers delivered by delegates from 37 countries. This conference saw no less than 8 Plenary Sessions, 5 Workshops and 19 Technical Sessions.It was a true gathering of minds spearheading the African remote sensing business.

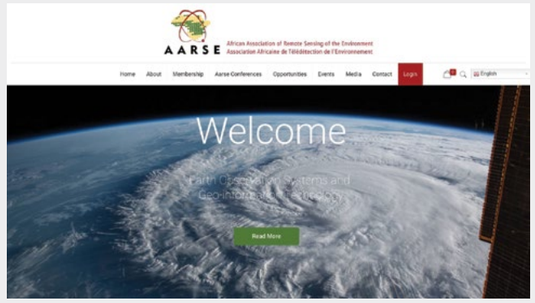
I'm sure the 13th AARSE Conference in Rwanda next year will be even better and hope to see you there. Remember to save the date from 26 - 29 October 2020 and watch out for conference details which will be announced soon.

It is indeed a privilege to be part of an organization with the ultimate goal of striving to improve the lives of others through peaceful means.

Good Reading

Prof. Kamal Labbassi

AARSE President
2018 - 2022



AARSE launches new website

We are proud to announce our brand new website which went live on Monday, 20 August 2019. The team who patiently worked on it had to overcome numerous problems pertaining not only the technicalities normally associated with operating a new website platform but also to create a much more user-friendly payment system. That is why we moved it to WordPress and now use a PayGate online payment system. This allows most credit card payments as well as EFT transfers worldwide. In addition we also created a NAIRA platform for our members in Nigeria.

I'm sure most will agree that it has a much more modern feel to it than the previous version and what's more it can also be read in four languages: English, French, Dutch and Portuguese. The website of course, belongs to all our members and anyone can make recommendations for changes through our Contact Page.

Please visit www.africanremotesensing.org and tell us what you think.

The 8th African Space Leadership Congress (ASLC): Addis Ababa, Ethiopia from 2-4 December 2019.

Addis Ababa the capital of Ethiopia has a population of up to three million people. It is the seat of Ethiopia's federal government and the economic hub of the country. It houses the headquarters of the African Union and the United Nations Economic Commission for Africa. The European Council on Tourism and Trade in 2015 named the city the number one destination in the world.
Images: http://www.orangesmile.com/ https://answersafrica.com

The 8th African Space Leadership Congress (ASLC) on *Space Science and Technology for Sustainable Development with the theme Prospects and Challenges of African Space Development* will be held in Addis Ababa, Ethiopia from 2-4 December 2019.

The congress is aimed at capitalizing efforts of African nations on space technologies to address key socio-economic challenges and harnessing the opportunities that space science and technology could provide.

The main focus areas of this congress are: assessment of space programs in Africa; space research and development; space policy, strategy and implementation and participation of the youth and women in aerospace. Besides, issues like voice of Africa towards equity in utilization of space resources, space commerce and entre-preneurship, space for peace and diplomacy as well as collaboration in space will be discussed.

The congress will serve as a primary and empirical platform for political leaders, space agencies, space vendors, entrepreneurs, scientists, engineers and technologists, regional and international space institutions to address major issues. It will also link and network Africa with the rest of the world and allow showcasing space products and services.

The main objective of the congress are to:

- promote the benefits of space science and technology among political leaders, decision makers, academia and researchers, space vendors, and the youth and women attending the congress;
- identify major challenges in implementing space programs in Africa and devise mechanisms;
- encourage regional and intra-Africa cooperation in space science and technology;
- inspire the youth and encouraging women's contribution in building the future Africa space industry;
- stimulate space commerce and entrepreneurship in contributing towards meeting the SDGs, GDP growth, and ensuring sustainable space industry in the continent;
- strengthen the congress and its activities through adoption of the constitution and other regulations.

The discussion points that will be dealt with in this congress are chosen to be aligned with the theme of the meeting that gives emphasis to the prospects of the space sector and the challenges to overcome in Africa. Some of the major topics that will be given prime focus in the main session include:

- current status of space programs in Africa;
- space policies, strategies and implementation;
- space coordination and collaboration among AU member countries, and internationally;
- the role space plays to overcome African challenges and achievement of SDGs and technology:
- innovation and entrepreneurship in outer space.

The 8th ASLC is expected to have about 300 participants, which will be distinguished professionals, politicians, business people and companies of the space industry, youth and women from all African countries and international collaborating nations as well as the public and private space institutions.

The 8th ASLC is expected to come forth with an adopted constitution that will govern the members, the congress and the secretariat; a resolution that contains fundamental decisions and directions for future action; proceedings of the congress and the way forward and recommendations for member countries, African space institutions, vendors and the global space community.

Please visit http://aslc.essti.gov.et for more information and registration.

The ASLC was established in 2005 in Nigeria by space-enthusiastic political leaders of a few African countries, scientists and supporters with the aim of creating partnerships to realize the aspiration of African countries and use space science and technology to support Africa's development. Since then, the African Leadership Conferences on Space Science and Technology for Sustainable development was held seven times: Nigeria (2005), South Africa (2007), Algeria (2009), Kenya (2011), Ghana (2013), Egypt (2015) and again in Nigeria (2018).

Focus on an African Personality in Space Science and Technology

Dr Bernie Fanaroff

South Africa's Dr Bernie Fanaroff, previous director of SKA South Africa, which included the design and construction of the MeerKAT radio telescope, was among fifty eminent scientists inducted as a Fellow of the prestigious Royal Society, in a ceremony in London, on 12 July 2019.

Dr Fanaroff was originally a radio astronomer and co-author of the Fanaroff-Riley classification of radio galaxies and quasars. Thereafter he was a metal industry union organiser, Head of the Office for the Reconstruction and Development Programme and Deputy Director General in President Mandela's Office. He chaired the Integrated Justice System Board, and the Inter-departmental committee on border control.

From 2003 to 2015, Dr Fanaroff directed the SKA project in South Africa, which resulted in South Africa winning the bid to host the SKA, and the successful design and construction of the MeerKAT radio telescope.

The South African Radio Astronomy Observatory (SARAO), a facility of the National Research Foundation, is responsible for managing all radio astronomy initiatives and facilities in South Africa, including the MeerKAT Radio Telescope in the Karoo, and the Geodesy and VLBI activities at the HartRAO facility. SARAO also coordinates the African Very Long Baseline Interferometry Network (VLBI) for the eight SKA partner countries in Africa, as well as South Africa's contribution to the infrastructure and engineering planning for the Square Kilometre Array Radio Telescope

In recognition of all his achievements Dr Fanaroff has been awarded the Order of Mapungubwe, the Karl G Jansky Lectureship, Lifetime Achievement award of the National Research Foundation, Academy of Science of South Africa Science-for-Society Gold Medal, award for Science Diplomacy from the Minister for Science and Technology, and the President's Award of the SA Institute of Electrical Engineers.

Manchester University has inaugurated the Fanaroff Lecture Series, and he is co-chair of the BRICS working group on high-performance computing, and a trustee of the Paleontological Scientific Trust. Recently, Dr Fanaroff became member of the Presidential Commission on the Fourth Industrial Revolution.

The Royal Society was established in London in 1660 and is the oldest scientific society in the world. A Fellowship of the Royal Society is awarded to individuals who have made a "substantial contribution to the improvement of natural knowledge, including mathematics, engineering science and medical science" and last Friday, Dr Fanaroff signed the same membership book as Isaac Newton, Robert Hook, Charles Darwin, Albert Einstein and Stephen Hawking.

"I want to congratulate Bernie, whom I have known and worked with in several contexts for many years, particularly in realising the SKA for South Africa. Bernie's induction as a Fellow to the Royal Society is well deserved recognition of his contribution to science, and society."

Dr Rob Adam

Dr Rob Adam, Managing Director of the South African Radio Astronomy Observatory acknowledged Dr Fanaroff's achievement: "I want to congratulate Bernie, whom I have known and worked with in several contexts for many years, particularly in realising the SKA for South Africa. Bernie's induction as a Fellow to the Royal Society is well deserved recognition of his contribution to science, and society."

Dr Fanaroff said that his appointment as a Fellow of the Royal Society is something he had never expected, or believed possible, and is deeply honoured to belong to such a prestigious group of scientists. He says his election is also recognition of the outstanding ability and performance of the SKA team in South Africa, and reflects the strong state of astronomy and technology in the country.

AU serious about harnessing space technology

"We have adopted a continental Space Policy and Strategy to build Africa's capabilities in Earth Observation and Satellite Communication among others, which are strategic in resources management, environmental management, and early warning systems. Space technologies provide unique opportunities to collectively address socio-economic development issues," says H.E. Sarah Mbi Enow Anyang, the new Commissioner for Human Resources, Science and Technology of the African Union Commission.

This statement, made on 9 August by H.E. Anyang, on the occasion of the inauguration of the China-Africa Institute and the International Symposium on Africa-China Cooperation and People-to-People Change follows hot on the heels of the AU's appointment of Egypt as the host country for the new African Space Agency.

Africa's outer space strategy is listed as one on the 14 flagship projects of the AU's Agenda 2063 the blueprint and master plan for transforming Africa into a future global powerhouse. These projects have been identified as key to accelerating Africa's economic growth and development as well as promoting the common identity of Africans by celebrating their history and vibrant culture.

Flagship Project number fourteen listed as "Africa Outer Space Strategy" is defined as follows: "The Africa outer space strategy aims to strengthen Africa's use of outer space

Agenda 2063 is the blueprint and master plan for transforming Africa into the global powerhouse of the future. It is the strategic framework for delivering on Africa's goal for inclusive and sustainable development and is a concrete manifestation of the pan-African drive for unity, self-determination, freedom, progress and collective prosperity pursued under Pan-Africanism and African Renaissance.

H.E. Sarah Mbi Enow Anyang, from Cameroon, was elected as the new Commissioner for Human Resources, Science and Technology of the African Union Commission.

to bolster its development. Outer space is of critical importance to the development of Africa in all fields: agriculture, disaster management, remote sensing, climate forecast, banking and finance, as well as defence and security. Africa's access to space technology products is no longer a matter of luxury and there is a need to speed up access to these technologies and products. New developments in satellite technologies make these accessible to African countries and appropriate policies and strategies are required to develop a regional market for space products in Africa."

The Statute of the Space Agency was adopted by the 30th Ordinary Session of the AU held in Addis Ababa, Ethiopia on 29 January 2018. The seven main Objectives of the African Space Agency as contained in Article 3 of this document are inter alia the following:

1. Harness the potential benefits of space science, technology, innovation and applications in addressing Africa's socio-economic opportunities and challenges;
2. Strengthen space missions on the continent in order to ensure optimal access to space-derived data, information, service and products;
3. Develop a sustainable and vibrant indigenous space market and industry that promotes and responds to the needs of the African continent;
4. Adopt good corporate governance and best practices for the coordinated management of continental space activities;
5. Maximise the benefits of current and planned space activities, and avoid or minimise duplication of resources and efforts;
6. Engage with its users through the establishment of Communities of Practice for each of the identified user requirements; and
7. Promote an African-led space agenda throughout mutually beneficial partnerships.

Further to this the Statute also defined the Functions of the Agency in Article 5 as follows:

1. Promote and co-ordinate the implementation of programmes and activities approved by the African Space Council;
2. Address user needs to ensure that the space programmes will play a critical role in improving Africa's economy and the quality of life of its peoples;
3. Support Member States and RECs in building their space programmes and co-ordinate space effort across the continent;
4. Enhance and facilitate access to space resources and services in an effort to leverage space-derived benefits to the whole continent;
5. Support Member States and RECs in building critical infrastructure and coherently develop, upgrade and operate cutting-edge African space infrastructure;
6. Co-ordinate development of the critical mass of African capacities in space science, technology and innovation through appropriate education and training programmes;
7. Foster regional co-ordination and collaboration;
8. Promote strategic intra-continental and international partnerships;
9. Strengthen research, development and innovation in space science and technology;
10. Co-ordinate and promote Africa participation in international efforts for the peaceful use of space science and technology for the welfare of humanity;
11. Raise awareness of the benefits of space programmes for Africa;
12. Engage Member States in space-related activities and research in Africa with the aim of fostering co-operation and avoiding duplication of efforts;
13. Take maximum advantage of national activities conducted by Member States and facilitate co-ordination of the activities of Member States; and
14. Operate on the basis of international cooperation.

It is clear that the African Space Agency from their future headquarters in Egypt faces a daunting task in co-ordinating these Objectives and Functions for the benefit of 55 African member states.

Report by Anthony Penderis

See more
https://au.int

Satellites and spy cameras to stop big game poaching in Africa

British satellite telecom Inmarsat has joined forces with a Washington DC non-profit called RESOLVE to put its satellites to work on behalf of endangered wildlife in Africa. Though it sounds like a pitch room idea for a Bourne movie, the solution will use AI, satellites, and local cameras to thwart would-be poachers.

RESOLVE has a decidedly technological approach to defending wildlife. The non-profit has developed a system called TrailGuard AI, which Intel helped develop and which is being funded and deployed by the Leonardo DiCaprio Foundation and National Geographic Society.

TrailGuard AI uses an AI-powered camera to detect humans in nature reserves, with 97 per cent accuracy, and instantly transmit images to park rangers' facilities, enabling them to identify would-be poachers and intervene. Inmarsat's network plays a key role. The solution relies on the company's L-band, global, mobile satellite communications network to ensure the transmission of these images to rangers, overcoming the lack of reliable terrestrial connectivity in most remote nature reserves. TrailGuard AI utilises Inmarsat's mobile BGAN terminals, which are simple to set up and connect to the units and can withstand harsh environments.

"For the TrailGuard solution to work effectively we need rock solid connectivity, which, in most remote African wildlife reserves, is only achievable with satellite. Inmarsat's global, ultra-reliable satellite connectivity was the only solution that could help us overcome the connectivity challenges we faced and connect our smart sensors deployed out in the parks. This is expected to detect 80 per cent of poaching gangs operating in each area, which is by far the most effective strategy based on the resources and manpower available."

The system got its first full-time trial when it was deployed in the Singita-Grumeti reserve in Tanzania in 2018. So far, the system has resulted in the arrest of around 30 poachers, many of whom were caught with bushmeat. RESOLVE is hoping to deploy the system at strategic chokepoints it's identified within 100 African parks with high incidents of poaching.

"Wildlife poaching in Africa is at epidemic levels, but despite the best efforts of dedicated rangers, the large park boundaries and rough terrain mean that they often only find out about poaching when it's too late," says Dr. Eric Dinerstein, Director of WildTech and the Biodiversity and Wildlife Solutions Program at RESOLVE.

"The TrailGuard solution acts as an early warning system, transitioning ranger teams into fully mobile, rapid-response units so that they can respond to would-be poachers and stop them in their tracks."

Report by Greg Nichols
https://www.zdnet.com
plus additional material
https://www.resolve.ngo

Some of RESOLVE's team members who describe themselves as collaborative leaders, mediators, policy experts, strategists, scientists, and facilitators. Centre at the back is Stephen D'Esposito, President and CEO. Image: www.resolve.ngo

Dr Mohamed Zahran

Egypt launches CubeSat

Egypt has sent a mini-satellite to the International Space Station, where it will be put into orbit next week, a senior state official said.

The Cube-Sat was completely designed, built and tested in Egypt, said Mohamed Zahran, Chief of the National Authority for Remote Sensing and Space Sciences.

The satellite is 1kg in mass and cost around EGP 1 million, he added.

Egypt co-operated with the Japanese space agency in testing the satellite before being shipped it to the US, where it was launched into space from Cape Canaveral in Florida, said Zahran.

The satellite is for research purposes, said the official, adding that it will also test space systems developed by the Egyptian space agency.

Another satellite of the same kind will be sent to space within two months, he added.

Source
http://english.ahram.org.eg

Eight African countries participate in growing Africa's space science and industry capabilities

The Square Kilometre Array (SKA) project is an international effort to build the world's largest radio telescope. The scale of the SKA represents a huge leap forward in both engineering and research and development towards building and delivering a unique instrument, with the detailed design and preparation now well under way. As one of the largest scientific endeavors in history, the SKA will bring together a wealth of the world's finest scientists, engineers and policy makers to bring the project to fruition. The SKA mid- frequency telescope will be hosted in South Africa.

Carla Sharpe, the South African SKA African Programme Manager.

With the support of the Department of International Relations (DIRCO) through their African Renaissance Fund (ARF), in 2012 South Africa initiated the AVN programme with eight African Partner countries: Botswana, Ghana, Kenya, Madagascar, Mauritius, Mozambique, Namibia and Zambia.

The programme aims to establish Very Long Baseline Interferometry (VLBI) capable radio telescopes in the SKA African partner countries through the conversion of redundant telecommunications antennas, new-build antennas or through the establishment of training facilities with training telescopes. Developing a network of VLBI capable radio telescopes on the African continent will allow for the transfer of knowledge and technology as well as the development of the necessary and transferable skills within participating countries.

"Astronomy telescopes generate a number of benefits around science, education and sustainability but do not generate revenues per se, hence we are exploring a model of co-locating Earth Observation ground infrastructure and co-located science instrumentation," says Carla Sharpe, the South African SKA African Programme Manager.

"This could add a number of additional advantages for the host country, in that it can become sovereign in its own Earth Observation data solutions as well as satellite infrastructure. Further job creation, industry development, innovation and transfer of skills are potential benefits of such a programme," says Carla

The first radio telescope of the AVN programme was inaugurated in Ghana in 2017.

"Exploring co-location models of space science and space industry infrastructure is advantageous for any country that wishes to start up their own Space Agency or wants to empower and grow their existing Space Agency and space science capabilities," says Dewald Lloyd the industry lead in the proposed co-location programme.

"A participating Government can ensure access to their own centralised Earth Observation data source for all their departments and with the aid of satellite technology be able to distribute this data for the management of the Environment (urban growth, water quality), Agriculture, Mining, Forestry, Fisheries, Food Security, Disaster Management (earthquakes, floods and fires) and National Security, to name but a few areas.

Report by Anthony Penderis, Editor AARSE Newsletter.

The first radio telescope of the AVN program was inaugurated in Ghana in 2017.

Call for papers on "Protection of cultural heritage sites on the Moon"

The European Space Policy Institute (ESPI), the European Centre for Space Law (ECSL), and the German Aerospace Center (DLR) invite students and young professionals worldwide to submit a paper on "Protection of cultural heritage sites on the Moon". All inspiring or well-written papers will be accumulated and published. In addition participants from or studying in ESA Member States will be considered for special prizes.

Participation is open for all students and young professionals worldwide (graduated within 6 years before the deadline/without age restriction to support lifelong learning). Submission is limited to one paper per person. The deadline is 30 September 2019 (CET, 23:30h). For more information on submission deadlines please visit https://espi.or.at

Please send your contribution in both a Word and pdf format simultaneously to the following two e-mail addresses to ensure, from a technical point of view, that your contribution is well received: Annette.Froehlich@espi.or.at; Annette.Froehlich@dlr.de

Call for Research Project Proposals for Postgraduate Research in 2020

The South African Radio Astronomy Observatory invites supervisors to submit Project Proposals for Postgraduate Research for 2020, in one or more of the following areas:

Science
Topics exploiting data projected to be available by 2020-21 from key existing radio astronomy instruments located in South Africa (MeerKAT, HERA, C-BASS, early versions of HIRAX, and HartRAO facilities -including astrometry and geodesy applications). Amongst these, MeerKAT is the highest priority area.

Engineering
- Radio astronomy antennas and receiver systems (including digitisation) associated with supported and hosted instruments.
- Real-time digital signal processing instrumentation for radio astronomy, specifically using FPGA and GPU platforms.
- Hardware and data analysis systems for detecting, monitoring and identifying Radio Frequency Interference (RFI), including the use of telescope data (e.g. using MeerKAT visibilities to locate RFI sources).
- Hardware, software and data analytic systems associated with the control and monitoring of radio telescopes.
- Instrumentation and data analysis systems to support geodesy undertaken by SARAO.

Queries with regards to the application requirements or the application procedure, may be directed to:
Dr Mthuthuzeli Zamxaka; Email: mzamxaka@ska.ac.za;
Tel: +27 11 442 2434; Online at https://skagrants.nrf.ac.za
Closing date for proposals: 23 September 2019

Call for papers for the Aeronautical Society of South Africa (AeSSA) 2019 Annual Conference from 16 to 18 October 2019.

The theme of the conference is African Aerospace: Innovation & Passion. To thrive in the aerospace industry today, one cannot be mediocre. Competing on the world stage requires innovative, world-leading components, technologies, aircraft and systems. Passion is what helps one to stay the course for development in aerospace.

Thematic areas for abstracts: Aerodynamics, fluid mechanics and control; Aerospace education; Aerospace manufacturing; Aerospace policy; Aerospace propulsion; Aerospace sensors; Aerospace structures; Aerospace systems; Aviation safety; Ballistics; Flight test; Satellite technology; and Space launch.

This unique event offers the delegates the opportunity to learn from fellow innovators and network with industry stakeholders, where all participants contribute to the discussion on African aerospace innovation and its growth on the continent.

The organizers of this three day conference is excited to have Ricardo Traven, the Chief Test Pilot – Boeing Charleston: 787 Dreamliner Program, and Billie Flynn, Lockheed Martin: F-35 Lightning II Test Pilot as keynote speakers.

The abstract deadline 20 September 2019 and must be submitted online at:
https://www.aessa.org.za/conference/submissions/form/

Fellowship Opportunity: United Nations Office for Outer Space Affairs

The United Nations Office for Outer Space Affairs (UNOOSA) is pleased to announce the "United Nations /European Space Agency Fellowship Programme on the Large Diameter Centrifuge Hypergravity Experiment Series (HyperGES)" as part of the UNOOSA's "Access to Space for All" initiative and in cooperation with the European Space Agency (ESA) and the European Space Research and Technology Centre (ESTEC) as part of ESA.

The fellowship programme is aimed at providing opportunities for scientists and researchers with a team of students from Member States of the United Nations with particular attention to developing countries to conduct their own hypergravity experiment series at the Large Diameter Centrifuge (LDC) facility located at ESTEC in Noordwijk, the Netherlands.

The HyperGES fellowship programme is open to research teams from entities that are located in Member States of the United Nations with particular attention to developing countries. Each team should consist of one academic supervisor (Team Leader - Prof./PhD, not a student), and several Bachelor, Master and/or PhD students.

The application deadline is 30 November 2019.
For more information please visit:
http://www.unoosa.org/oosa/en/ourwork/psa/hsti/ldc_hyperges/1st_cycle_2019.html

Free SAR handbook for Forest Monitoring and Biomass Estimation

SERVIR, a joint venture between NASA and the U.S. Agency for International Development in Washington, just announced the release of the Synthetic Aperture Radar (SAR) Handbook: Comprehensive Methodologies for Forest Monitoring and Biomass Estimation. This handbook contains a collection of state-of-the-art methods and theoretical background to facilitate the use of SAR data for forest monitoring and biomass estimation.

The SAR Handbook is a "living" document, freely-available online as an e-Book hosted on the SERVIR Global website. Each chapter is authored by a world-renowned SAR expert, and has gone through extensive reviews and testing by the SERVIR Global network. The development of this handbook and associated training materials are the result of years of work and a strong partnership between SERVIR and SilvaCarbon, a U.S. government program working to enhance capacity around the world in monitoring and managing forests.

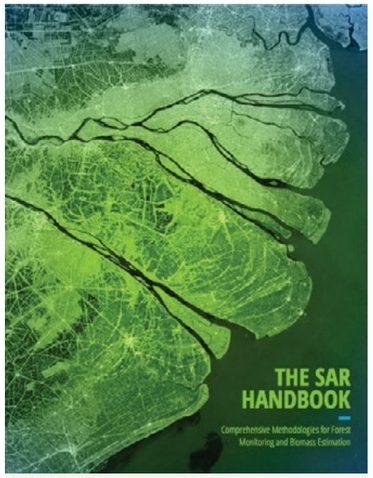
Aligning with the SERVIR mission to build capacity in the use of geospatial and Earth observation technologies, this initial Handbook release also includes a set of complementary materials:

1) One-page quick reference guides highlighting key concepts derived from the SAR Handbook, and

2) An animated video geared towards a general audience explaining in straightforward language how SAR can capture information for forest monitoring.

The overall goal of the SAR Handbook and associated materials is to provide easily understandable technical materials to remote sensing specialists that may not have expertise on SAR, but are interested in leveraging this technology in the forestry sector. We strive to empower users to implement SAR data in their routine workflows.

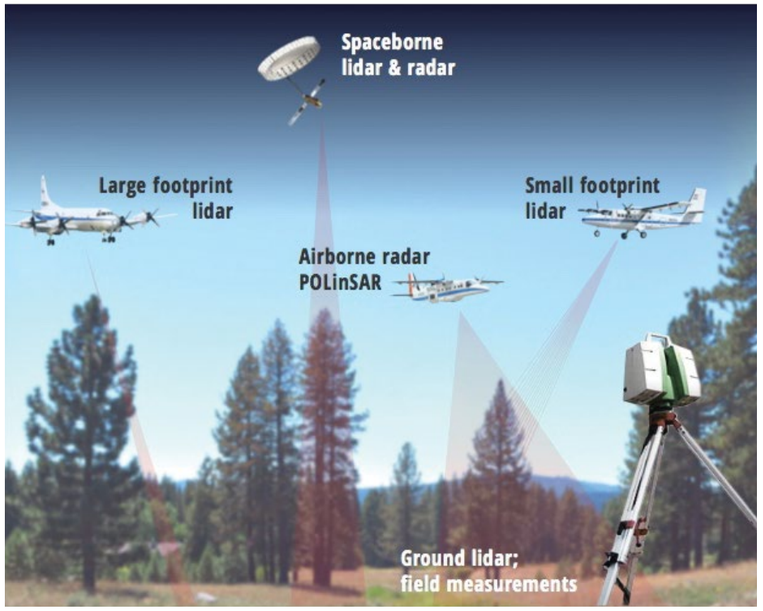
The SERVIR Global website will host step-by-step tutorials, training modules, and open-source scripts that can be used to develop SAR-derived products for forest monitoring and biomass estimation.



The cover page of the Synthetic Aperture Radar (SAR) Handbook: Comprehensive Methodologies for Forest Monitoring and Biomass Estimation. This 309-page free e-Book has been produced by SERVIR, a joint venture between NASA and the U.S. Agency for International Development in Washington.

With the wealth of freely and openly available SAR datasets, such as Copernicus Sentinel-1 and ALOS PALSAR, and upcoming SAR missions with open data policies, such as NISAR and BIOMASS, there is immense need for resources that effectively explain how to use and process these powerful datasets for specific applications.

Download SAR Handbook here:
https://gis1.servirglobal.net/TrainingMaterials/SAR/SARHB_FullRes.pdf



Remote Sensing methods

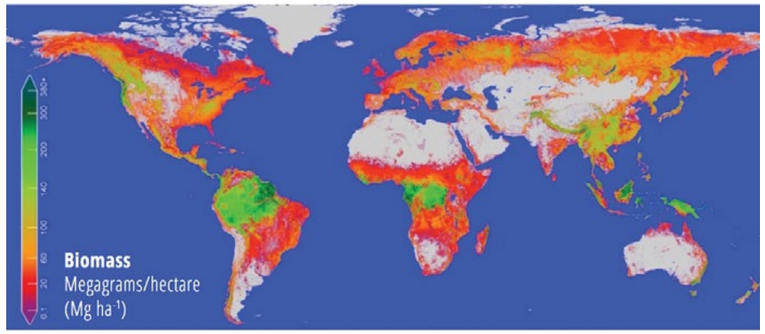
Ground and remote sensing measurement techniques to quantify forest structure and AGB. SAR Handbook Figure 5.3/Page 209

About SERVIR

SERVIR, a joint venture between NASA and the U.S. Agency for International Development in Washington, provides state-of-the-art, satellite-based Earth monitoring, imaging and mapping data, geospatial information, predictive models and science applications to help improve environmental decision-making among developing nations in eastern and southern Africa, the Hindu-Kush region of the Himalayas and the lower Mekong River Basin in Southeast Asia.

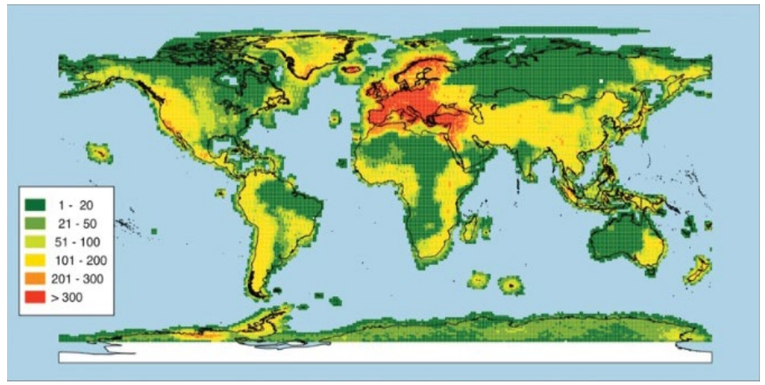
Developed in 2004 by researchers at NASA's Marshall Space Flight Center in Huntsville, Alabama, and implemented through NASA partnerships with leading regional organizations around the globe, SERVIR – its name derived from a Spanish word meaning "to serve" – provides critical information and support services to help national, regional and local governments, forecasters, climatologists and other researchers track environmental changes, evaluate ecological threats and rapidly respond to and assess damage from natural disasters.

With activities in more than 30 countries and counting, the SERVIR team already has developed more than 40 custom tools, collaborated with more than 200 institutions and trained approximately 1,800 regional support staffers, developing local solutions and linking regional offices around the globe to create a thriving, interactive network. Web-based satellite imagery, decision-support tools and interactive visualization capabilities previous inaccessible across many these regions now enable stakeholders to work together to combat floods, wildfires, superstorms and other calamities, and also to address long-term environmental shifts tied to climate change, biodiversity, drought and other factors.



Biomass

Distribution of forest AGB density in global ecosystems showing the high biomass in tropical rainforest regions and relatively lower biomass in extra-tropics extending to temperate and boreal regions with vast areas of forest cover. Map is produced at 1-km spatial resolution using a combination of ground, lidar, and radar measurements by Saatchi's team at the Jet Propulsion Laboratory, California Institute of Technology. SAR Handbook Figure 5.1/Page 207



Sentinel Coverage

Global IW-mode coverage of Sentinel-1 between October 2014 and August 2016. SAR Handbook Figure 1.29/Page 60

Author Credits

The Synthetic Aperture Radar (SAR) Handbook: Comprehensive Methodologies for Forest Monitoring and Biomass Estimation was edited by Africa I. Flores-Anderson, Kelsey E. Herndon, Rajesh B. Thapa, and Emil Cherrington.
Chapters were authored by SAR experts Franz Meyer, Josef Kellndorfer, Paul Siqueira, Sassan Saatchi, Marc Simard, and Hans Andersen.
SERVIR hub point-of-contacts contributed greatly to the international trainings and material development, especially Rajesh Thapa (ICIMOD/SERVIR-Hindu Kush-Himalaya), Phoebe Oduor (RCMRD/SERVIR-Eastern & Southern Africa), Nguyen Hanh Quyen (ADPC/SERVIR-Mekong), and Bako Mamane (AGRHYMET/SERVIR-West Africa).

See more at

https://www.servirglobal.net/Global/Articles/Article/2697/release-of-synthetic-aperture-radar-sar-handbook-to-empower-the-monitoring-and

Conference report: SA GeoTech 2019

Geospatial and construction IT solutions conference SA GeoTech 2019, which took place on 22 to 23 July 2019 in Gauteng, explored various Geotech applications and the opportunities they offer to drive business and economic growth. Case studies over the two days showed an existing culture of innovation in an industry which already embraces fourth industrial revolution information tools and technologies daily used.

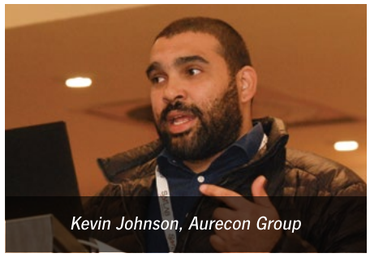
New trends such as the integration of geospatial sciences and statistics were highlighted by keynote speaker Dr Arul Naidoo from the Institute for Spatial Data Science. He showed how spatial statistics can add greater value and depth to geospatial data analyses, using examples such as how Esri's Space Time Cube allows location-over-time analyses. Helene Verhoef's presentation from Stats SA also focuses on creating more detailed data, and considered the design of an ideal output area for South Africa's census geography.

Prof. Fred Cawood, the director of the Wits Mining Institute (WMI), considers Geotech a fourth industrial revolution technology which needs to unite with other disciplines for 21st century mining. Calvin Opiti, also from the WMI, illustrated this well in his presentation on spatial temporal modelling and analyses using GIS for improved underground mine health and safety. Subscan's Hennie le Roux followed suit, showing the many applications of ground penetrating radar and related technologies and how they save money and lives by avoiding utility strikes and other risks.

To realize Geotech's multidisciplinary benefits requires collaboration, as explained by speakers such as Celiwe Kgowedi from the Office of the Gauteng Premier, the CSIR's Alize le Roux, and the City of Johannesburg's Marcelle Hattingh and Eric Itzkin, who all worked on multi-disciplinary projects.

Sandiswa Sondzaba, Yashena Naidoo and Bonolo Mohulatsi from the Gauteng City Region Observatory (GCRO)

Dr Arul Naidoo opening keynote speaker at SA GeoTech 2019



Kevin Johnson, Aurecon Group

Celiwe Kwogedi was awarded the prize for best presentation for day one of SA GeoTech

Alize le Roux, CSIR

Industrializing geotechnologies and geo-information processing principles will create new business opportunities believes MapIT's Etienne Louw. The best example of this came from Dave Wibberley, the MD of Adroit Technologies, in his presentation on the integration of GIS and SCADA. SCADA and HMI (Human Machine Interfaces) underpin IoT, smart buildings, smart cities, automation and industrial applications more broadly.

Industrializing geotech entails automating it for repeatability, something Aurecon's Kevin Johnson did in a proof of concept which applies machine learning to aerial photography to automatically determine road width. His colleagues Nerine Joubert and Richard Matchett too are designing digital models and project information for digital twins over a project's entire lifecycle.

Other speakers such as Arrie van Niekerk also inspired delegates to renew their thinking on optimizing their workflow by applying the theory of constraints, explaining why an efficient business is usually on the brink of bankruptcy, and how rethinking capacity around workflow bottlenecks.

There were also many other interesting presentations on using map codes, how municipalities can use web-based GIS to manage their revenue, on data visualization, how new markets can be understood with geospatial data and many more. The presentations and papers are all available online at the link below.

The conference also included a panel discussion on the convergence of geotechnologies, as well as three workshops and four tech-talk sessions which introduced and offered delegates hands-on experience with technologies such as aerial imaging and mobile mapping systems.

Prizes were also awarded to the best presentations on each day, with Celiwe Kwogedi winning the day one prize, and the second day prize awarded to Nerine Joubert and Richard Matchett. The best large exhibition stand prize went to Leica Geosystems, and Pepperl+Fuchs won the best small exhibition stand prize. Several other lucky draws for anything from a tour of SANSA's Hartebeesthoek facility to coffee machines and cameras were also held.

Report by Pierre Potgieter, EE Publisher;
positionit@ee.co.za

See more
https://www.ee.co.za

Etienne Louw, Andries Botha, Helene Verhoef, Narine Joubert, Richard Matchett and Arrie van Niekerk.

International Space Conference Diary 2019

We have assembled the details of the most important international and African conferences in the arena of remote sensing, satellites and geotechnical applications scheduled for the next few months. Please visit their individual websites for more information on submission criteria for papers, deadlines for registration, etc.

HEASA 2019
August 28 –30, 2019;
Swakopmund, Namibia
https://fskbhe1.puk.ac.za

Hosted by the University of Namibia the goal of this conference to bring together scientists from the southern African region, the African continent, and around the world with an interest in high-energy astrophysical phenomena. The deadline for registration and abstract submission is on August 4, 2019.

Copernicus Hackleton
October 11-13, 2019; Bari, Italy
https://hackathons.copernicus.eu

The Humans To Mars Summit (H2M) is to advance humanity to the Martian surface by the 2030s. Keynote speakers will include NASA Administrator Jim Bridestine and the 'Second Man on the Moon' Buzz Aldrin.

Africa Geospatial Data/Internet Conference
October 21 – 25, 2019; Accra, Ghana
www.afrigeocon.org

The Conference serves to bring people together from various stakeholder groups as equals and to facilitate a common understanding of how to maximize geospatial and Internet opportunities in Africa and address risks and challenges.

IAC 2019
October 21-25, 2019;
Washington DC, USA
http://www.iafastro.org

Hosted by the American Institute of Aeronautics and Astronautics this 70th International Astronautical Congress is possibly the largest gathering of space professionals. It promises an intense week to discuss the advancement and progress of space and celebrate the 50th anniversary of the moon landing.

DC5G 2019
November 4-5, 2019;
Arlington, Virginia, USA
https://2019.dc5g.com

Launched in 2017 at the request of the community and after two successful years the organizers are forging ahead to find objective, problem-solving discussions tackling 5G infrastructure. The aim of the event is to outline realistic steps for organizations to build and implement next-generation wireless services.

CyberSat Summit
November 7-8, 2019;
Reston, Virginia, USA
https://2019.cybersatsummit.com/

CyberSat Summit is the only satellite security event in the world that fuses satellite, space, cyber and government to discuss cyber-specific threats that could be made against satellites and ground infrastructure. How does the mind of a hacker work that targets your infrastructure? The Summit is preceded by a Classified Day on 6 November.

AfricaGIS 2019
November 18 - 22, 2019;
Kigali, Rwanda
www.eis.africa/africagis-2019

The largest Geospatial, Science and Technology conference on the African Continent held every two years.
It explores the role of innovations in geospatial information and its implication in addressing the 17 targets of the Sustainable Development Goals for Africa.

African Space Leadership Congress
December 2–4, 2019;
Addis Ababa, Ethiopia
http://aslc.esti.gov.et

The 8th African Space Leadership Congress (ASLC) will be hosted by the Ethiopian Space Science and Technology Institute. The main focus areas are: assessment of space programs in Africa; space research and development; space policy, strategy, implementation and participation of youth and women in aerospace.

SmallSat Symposium
February 3-6, 2020;
Silicon Valley, San Francisco, USA
https://2019.smallsatshow.com/category/news/

Hosted by Satnews Publishers since 1983, it focuses on new technologies and the business environment shaping the implementation of smallsat constellations, launchers, the challenges facing the smallsat developer and actors and the benefits of these advanced technologies to our world. More than 100 speakers will attend.

Space Alphabet

The space industry is not called “burgeoning” for nothing. There is so much happening that it’s difficult to keep track of all the new developments all the time. In this issue we bring you once again a number of the most recent announcements in alphabetical order.

Amos-17

Launched on 6 August 2019 on a SpaceX Falcon 9 rocket this Boeing-built satellite will be stationed over Africa to deliver television, internet and data services to the African continent, the Middle East and Europe, a potential market comprising hundreds of millions of people. Once operational, AMOS-17 will be the most advanced high-throughput satellite to provide satellite communication services to Africa. With both fixed and steerable beams, the multi-band Amos-17 satellite can provide continual service to long-term customers while moving bandwidth to accommodate short-term demand for high capacity throughput, for example, during special events or natural disasters. Amos-17 belongs to Israeli operator Spacecom.

See more
https://www.satellitetoday.com
https://www.amos-spacecom.com

Blue Origin BE-4

The BE-4 rocket engine would be the main engine for Jeff Bezos’ new orbital-class New Glenn rocket and is also supposed to power United Launch Alliance’s semi-reusable Vulcan rocket. Both these rockets are scheduled to undertake their maiden flights by 2021. Bezos is not as outspoken as his competitor SpaceX’s CEO Elon Musk but it is known that their headquarters in Kent, Washington are soon moving to a to a 200,000-square-foot factory currently under construction in Huntsville, Alabama. Another 750,000-square-foot facility is planned for the New Glenn rocket assembly in Florida.

See more
https://www.geekwire.com

Chandrayaan 2

Chandrayaan 2 is India’s mission to the moon which lifted off on 22 July 2019 on a GSLV Mk 111 rocket from the Sriharikota Space Center, on India’s southeast coast. Its payload is intended for a lunar landing on 6–7 September 2019. It will consist of a Vikram lander and Pragyan rover that would gather the first on-the-ground scientific data from a region that NASA is targeting for a crewed landing in 2024. This will make India the fourth nation to set a probe safely down on the moon’s surface, after Russia, the United States and China.

See more
https://www.geekwire.com

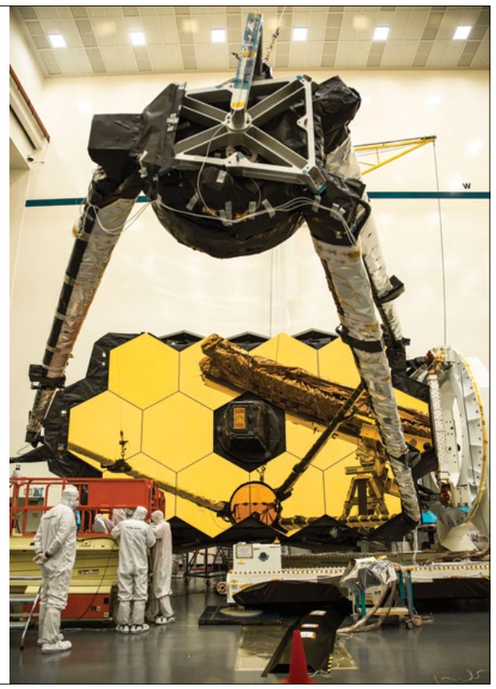
James Webb Telescope

Lindsay McLaurin/Northrop Grumman: NASA’s James Webb Space Telescope’s Secondary Mirror Support Structure (SMSS) was deployed for the first time using the telescope’s flight electronics at Northrop Grumman’s clean room in Redondo Beach, California. The milestone marks another major interaction of the Observatory (Optical Telescope and Integrated Science Instrument [OTIS] module and the Spacecraft Element [SCE]), working together as they will in orbit.

The deployment was the first time Webb’s secondary mirror’s deployment and latching motors were driven by the electronics in the spacecraft bus, which used the flight software reading the flight telemetry in the exact same way that it will be done in flight.

In this joint effort, electrical and mechanical engineering teams across NASA and Northrop Grumman worked together to successfully execute this milestone. This was also the last time the SMSS will be deployed on the ground—the next time will be after launch in space (currently scheduled for March 2021).

See more
https://news.northropgrumman.com



A view of NASA’s James Webb Space Telescope’s Primary Mirror and deployed Secondary Mirror Support Structure at Northrop Grumman’s clean room.

Newquay Spaceport

UK Science Minister Chris Skidmore announced in a speech on 16 July 2019 that his government has joined up with Cornwall Council to invest a total of £20 million into the Newquay Spaceport, which is developing horizontal launch operations with Virgin Orbit. This will be the world’s first horizontal launch Spaceport operating by 2020 with the launch capability for human space flight, Small Sat launches and passenger services integrated.

The new venture will create 150 immediate jobs and £200m of GVA to UK and Cornwall. From this port Virgin Orbit’s ‘Cosmic Girl’, a Boeing 747, will use a LauncherOne rocket, for small satellite launches to LEO, MEO, GEO and beyond.

Factors that played a role in the selection of this site are inter alia that it is one of the UK’s longest runways at 2,744m; the uncongested and clear segregated airspace; low population density in the area; and direct access to sea.

UK Science Minister Chris Skidmore who announced that his government has invested a total of £20 million into the Newquay Spaceport.

See more
https://spaceportcornwall.com
https://www.gov.uk

OneWeb

Despite using Russian rockets and launch sites to launch their satellites OneWeb has been denied permission to provide internet services to Russia. The Russian Federal Security Services stated that the satellites could be used for espionage.

Founded by US entrepreneur Greg Wyler and headquatered in the UK, Oneweb is currently leading the race to provide internet services via small satellites to the whole world. Is has already launched its first six test satellites which are working well in Low Earth Orbit (LEO). All can deliver high-speed services at more than 400 Megabits per Second (Mbps) which will enable users access real-time video streaming in Full High Definition (HD) from space. The total number of satellites will be bumped up to 650 initially and eventually grow to 1 980 satellites in total.

See more
https://soylentnews.org
https://www.satellitetoday.com

Artist rendition of SpaceX’s Starship which CEO Elon Musk hopes will be able to carry the first human beings to Mars. Image SpaceX/Flickr

Starhopper

Starhopper is a crude prototype test vehicle filled with water to test SpaceX’s Raptor rocket engines which will be required for their orbital Starship spacecraft intended for journeys to the Moon and Mars. SpaceX wants to build and fly to orbit with the full orbital version of the Super Heavy Starship in 2020 which would require seven Raptor engines.

The Starhopper has successfully undertaken its first real test flight under the power of a Raptor (SN6) engine at the SpaceX’s test facility in Boca Chica, Texas on Thursday, 25 July 2019. The first flight was only a hop of 20 m high with a 200 m high hop planned to follow soon.

See more
https://www.nasaspaceflight.com

TESS

TESS is the acronym for NASA’s Transiting Exoplanet Survey Satellite. Its mission is to comb outer space for exoplanets outside our own solar system which could harbour life.

In a paper published recently in the Astrophysical Journal Letters, a team led by Lisa Kaltenegger, associate professor of astronomy and director of Cornell’s Carl Sagan Institute, announced that TESS discovered the first nearby super-Earth that could harbour life.

This super-Earth 31 light years away called planet GJ 357 has a thick atmosphere and could maintain liquid water on its surface like Earth. The team is confident that with upcoming telescopes it would be possible to spot signs of life soon on this planet.

See more
http://www.spacedaily.com

The 50th anniversary of the first moon landing

The official crew portrait of the Apollo 11 astronauts. Pictured from left to right are: Neil A. Armstrong, Commander; Michael Collins, Command Module Pilot; Edwin E. "Buzz" Aldrin, Lunar Module Pilot. Image: NASA

Last month marked the 50th anniversary of the first humans landing on the Moon on July 20, 1969. The first steps taken by humans on another planetary body were on this day by commander Neil Armstrong and lunar module pilot Buzz Aldrin.

Armstrong and Aldrin spent 21 hours, 36 minutes on the moon's surface before they returned to their command module orbiting the moon piloted by Michael Collins and then back to Earth with the first samples from another planetary body.

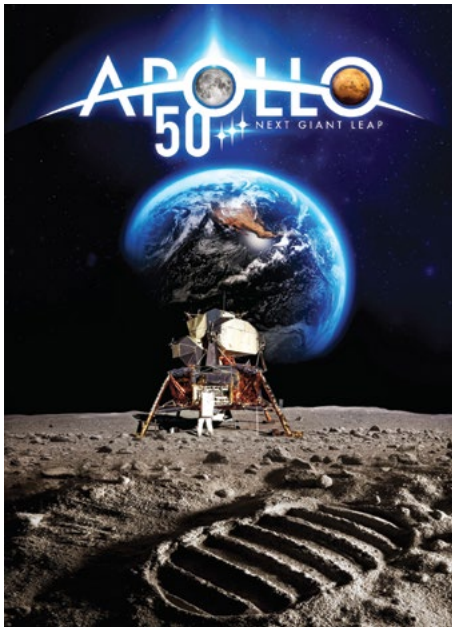
The total trip started on 16 July 1969 with lift-off from Kennedy Space Center, Florida to plash down in the Pacific on 24 July 1969. This historic Moon landing not only proved that anything is possible but also paved the way for future space exploration.

NASA's Apollo 11 lunar mission which resulted in the first landing, was part of the bigger Apollo program of the 1960s and '70s which included nine missions to the Moon, six of which landed on moon.

Some 400 000 people worked on the 11-year Apollo program that included 33 space flights. During this period there were only three fatalities when astronauts Virgil "Gus' Grisson, Ed White and Roger Chaffee died in a capsule fire during a test on the launch pad in January 1967.

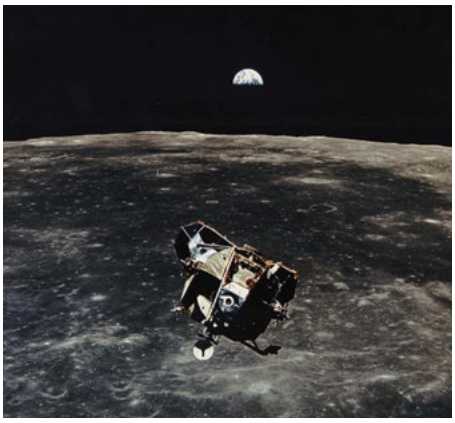
NASA marks the anniversary with numerous celebrations, exhibitions and educational projects all over the world which started in Oct. 2018 and will continue until Dec. 2022.

See more
https://images.nasa.gov
https://www.moonlanding50.org



One of the NASA's Apollo 50th Anniversary posters which depicts President Kennedy's goal of "putting a man on the moon and returning him safely to Earth by the end of 1960s". Image: Matthew Skeins/NASA

Three of 18 different language NASA official anniversary logos in English, Arabic and French. Images: NASA



The Lunar Module carrying Armstrong and Aldrin on its way back to its rendezvous with the Command Module orbiting the Moon. The LM was full of gear with which to communicate, navigate, and rendezvous. It also had its own propulsion system, and an engine to lift it off the Moon and send it on a course toward the orbiting CM. Image: NASA

The crew was airlifted to safety aboard the U.S.S. Hornet, where they were quartered in a Mobile Quarantine Facility (MQF) for three weeks. The quarantined Apollo 11 crew members (l to r) Armstrong, Collins, and Aldrin share a laugh with U.S. President Richard Milhous Nixon who was aboard the recovery vessel awaiting the return of the astronauts. Image: NASA