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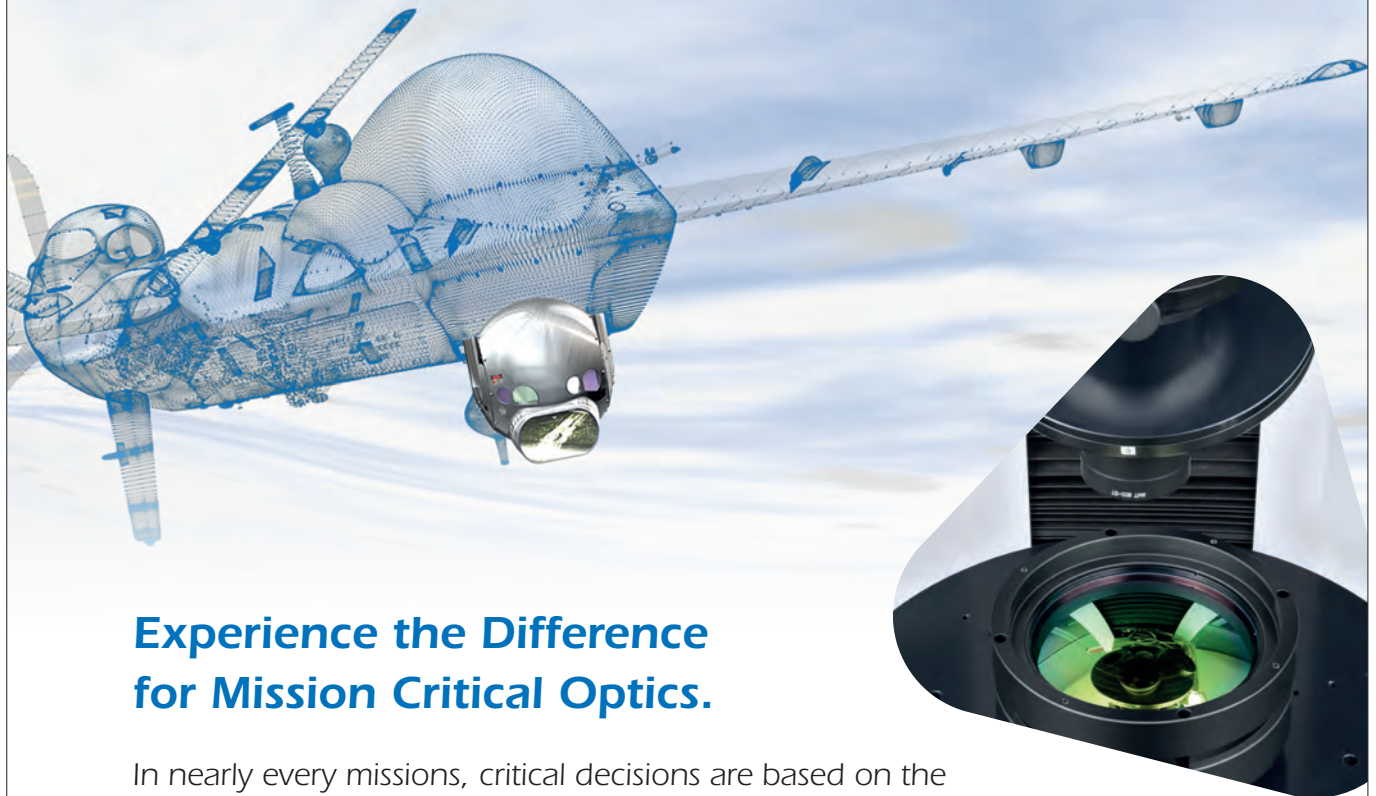
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Spacecraft 'issues' delay Webb telescope launch another year

Extension of final integration and test phase sees launch window pushed back to May 2020.

The launch of the James Webb Space Telescope (JWST) has been delayed once again, with additional time needed for final integration and testing of the spacecraft that will carry the payload into orbit.

NASA announced in a teleconference that it had now pushed the JWST launch window back to "approximately" May 2020. Last September, the space agency said that the planned October 2018 launch had been revised to between March and June 2019, after assessing the final integration and test schedule.

development budget that was agreed back in 2011 when the future of the entire project was under threat, meaning that US Congress will have to mandate any additional cost.

Highest priority

Acting administrator Robert Lightfoot said in a NASA release: "Webb is the highest priority project for the agency's Science Mission Directorate, and the largest international space science project in US history.

"All the observatory's flight hardware is now complete, however, the issues brought to light with the spacecraft element are

campaign, commissioning stage, and deployment sequence.

Both the external board – which will be chaired by spaceflight veteran Thomas Young – and NASA's existing internal review panel will contribute to a progress report that will be delivered to Congress this summer.

The delay means that NASA will have to agree on a new launch readiness date with the European Space Agency (ESA), whose contribution to the project is to provide the launch vehicle. One of ESA's Ariane 5 rockets will eventually fire JWST into an orbit around a million miles from Earth.

"Additional steps to address project challenges include increasing NASA engineering oversight, personnel changes, and new management reporting structures," NASA added.

Next stage

Late last year, NASA said that the JWST's telescope and scientific instrument payload had passed cryogenic tests at the Johnson Space Center in Houston, after which the equipment was delivered to the Redondo Beach site for spacecraft integration.

"The spacecraft element will next undergo environmental testing, subjecting it to the vibrational, acoustic and thermal environments it will experience during its launch and operations. These tests will take a few months to complete," NASA now reports. "Engineers then will integrate and test the fully assembled observatory and verify all components work together properly."

Thomas Zurbuchen, associate administrator for NASA's Science Mission Directorate, added: "Considering the investment NASA and our international partners have made, we want to proceed systematically through these last tests, with the additional time necessary, to be ready for a May 2020 launch."

The latest schedule means that, assuming it is launched in May 2020, the JWST will reach orbit fully seven years later than was originally planned.

<http://optics.org/news/9/3/39>

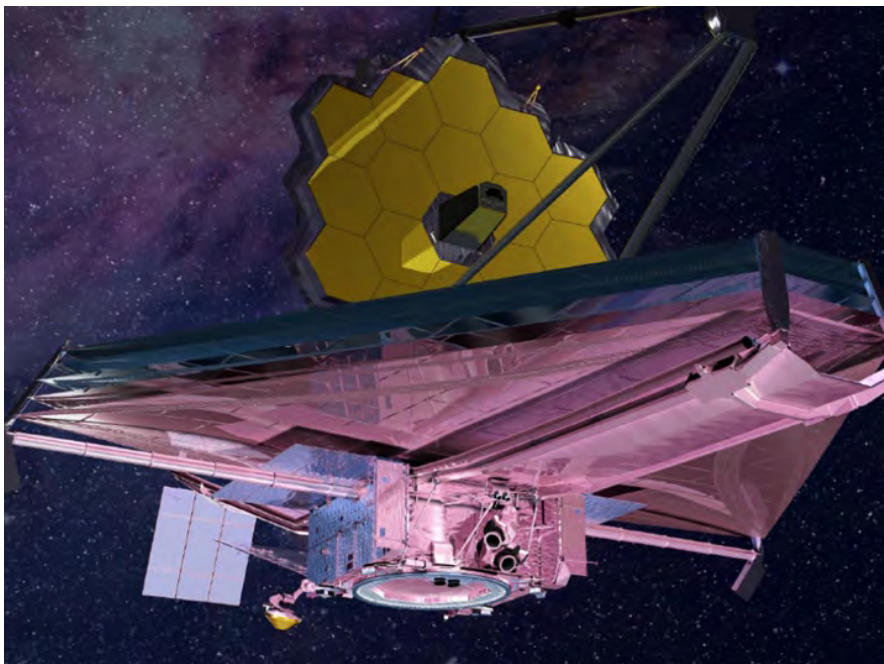


image: NASA

While JWST's telescope optics and scientific instrumentation have cleared tests, the equipment must still be assessed following integration with the spacecraft set to carry the payload to its LaGrange point orbit - and that schedule has now slipped by around a year. The latest estimate from NASA is for a May 2020 launch, some seven years later than the original plan.

While NASA said that its latest tests demonstrate that the various elements of the telescope and spacecraft individually meet their requirements, more time was needed to perform environmental testing on the combined hardware. That assessment is taking place at key contractor Northrop Grumman's Redondo Beach, California, facility.

The latest delay will also see NASA provide a new cost estimate that seems likely to exceed the capped \$8 billion overall

prompting us to take the necessary steps to refocus our efforts on the completion of this ambitious and complex observatory."

Specific issues include completing the all-important sunshield, which is needed to protect JWST from solar damage and heating.

NASA is also setting up an external, independent review board, which it says will "bolster confidence" in the agency's approach to completing the final battery of tests, as well as the forthcoming launch

Defense giant L3 backs Peak Nano Optics

Deal to help developer of nano-layered graded index optics expand manufacturing output.

US defense contractor L3 Technologies has made an investment in Texas-based Peak Nano Optics, a maker of nano-layered graded-index (GRIN) optics technology.

While precise financial details of the agreement have not been released, the firms described a "significant minority investment" that closed on February 6, comprising an equity and development package that forms part of a broader expansion plan at Peak Nano Optics.

The deal follows a \$5.8 million series A round of venture financing closed almost exactly a year ago, when Peak Nano Optics said it had been "inundated with requests" from potential customers interested in applications within military, firearms sights, augmented and virtual reality, and medical markets.

Disruptive plan

The firm, a joint venture between Peak Nano and the Case Western Reserve University spin-out PolymerPlus, is working to commercialize and scale-up production of what it expects to be a disruptive optics technology.

Its nano-layered GRIN lenses are claimed to be 80 per cent lighter than conventional doublet and triplet lenses, and to offer three times better contrast, much-improved resolution, a wider field of view, and reduced chromatic aberration.

Peak Nano Optics' CTO Michael Ponting has previously likened the GRIN lens design to the structure of the human eye, which provides a very efficient means of controlling the pathway of light without relying on complicated optics.

And in a white paper published on the company's web site last year, Ponting described various optical designs incorporating the polymer-based GRIN lenses, developed using Zemax optical design software.

Peak Nano's CEO Jim Welsh said in a release from the two companies that he was



'Nanolayers change everything' is the claim by Peak Nano Optics, which will use the L3 investment to help scale up production of its polymer-based GRIN lenses this summer, and to penetrate commercial applications across AR/VR, medicine, and elsewhere.

"thrilled" to have L3 on board, adding: "L3 operates as an industry leader in many of the markets where our lens technology makes a tremendous impact on system-level performance, which creates new opportunities for our technology.

"This transaction allows us to dramatically accelerate our efforts in much larger adjacent markets, such as virtual reality, where we expect to shape the next generation of optical platform solutions."

Commercial crossover

Initially developed for high-end military applications, and attracting the attention of the US Defense Advanced Research Projects Agency (DARPA), the nanostructured GRIN lens technology was released for commercial applications in 2016.

Following its investment, seen as a "series B" validation round, L3 says that new product launches could start appearing as soon as next year.

Jeff Miller, the president of L3's sensor systems business segment, said: "In Peak Nano Optics, we quickly saw the potential for GRIN lens technology, not only in our current markets, but also in its ability to

be transformative in a broad range of emerging systems, such as virtual and augmented realities, and the commercial space."

Peak Nano's COO Chad Lewis added: "This is the first step in the Peak Nano process, which begins with the identification of commercial opportunities for emerging nanotechnologies and culminates in a real-world consumer product. Taking innovation from the point of discovery and scaling it up to meet the demands of the consuming public is at our core."

Following last year's series A funding round, Peak Nano Optics says it has spent the last 12 months designing an advanced, automated production line with integrated robotics at its facility in the Dallas area.

That line is expected to become operational this summer, adding to an existing low-volume site in Cleveland, Ohio, and greatly expanding production volumes. "This round of funding will also enable Peak Nano to advance its offerings in virtual and augmented realities as well as make new advancements in biomedical technology," the company added.

<http://optics.org/news/9/2/42>

Image: Peak Nano Optics.

NASA and LeoSat sign development deals for laser satellite links

Separate agreements both aimed at ‘revolutionizing’ space communications with free-space optical networking.

NASA has signed what is being described as an “industry-first” agreement with US-based BridgeSat that it is hoped will result in a commercial laser communication system to support future satellite missions.

BridgeSat says that the reimbursable agreement represents the latest milestone in its effort to deploy a global communication system based around free-space optical links to low-Earth orbit (LEO) satellites – something that it claims will be not just faster, but also much less expensive than traditional radio frequency (RF) connectivity.

In-orbit testing next year

BridgeSat’s engineers are set to collaborate with NASA’s Applied Engineering and Technology Directorate, as well as the Space Communications and Navigation (SCaN) program within the Human Exploration and Operations Mission Directorate.

The Washington, DC, company says the deal will involve NASA helping BridgeSat to refine the design of the system, to meet its interoperability requirements, and achieve compliance with Federal Aviation Administration (FAA) regulations.

“A ground station demo will be complete by late 2018, with in-orbit testing finished by May 2019,” BridgeSat predicted.

Its CEO Barry Matsumori added in a company release: “This industry-first agreement is a strategic win not only for NASA and BridgeSat, but also for the other government agencies and businesses that could benefit from our technology once it’s commercialized.

“Together, we’re meeting the global need for secure, reliable satellite communications for mission-critical and bandwidth-intensive applications.”

Hossin Abdeldayem, a senior technology manager at NASA’s Goddard Space Flight Center, echoed those thoughts, explaining



Image: LeoSat Enterprises.

LeoSat is planning to launch a constellation of between 78 and 108 low-Earth orbit (LEO) satellites, each with four optical links, to provide a global high-speed and secure network aimed at business-to-business customers. The first launches are scheduled for 2021.

that the out-sourcing deal should mean that NASA is able to deploy the next-generation technology more quickly and at lower cost than if it was to develop the technology in-house.

LeoSat links

Meanwhile LeoSat Enterprises, which is planning to launch a constellation comprising more than 100 laser-linked low-Earth orbit (LEO) satellites, has signed an agreement with Phasor that will enable customers to access the future network with more conventional RF links.

Under the terms of the deal, Phasor is to develop a high-power electronic steerable array (ESA) operating in the microwave (Ka-band) spectrum that will enable LeoSat customers to access the anticipated gigabit-speed, high-security satellite network.

“Phasor’s LEO-capable antenna technology will enable corporations, governments and other high-end users to access a network offering speeds about 1.5 times faster than terrestrial fiber, in combination with high-

throughput, ultra-security and very low latency,” stated LeoSat, which like Phasor and BridgeSat is headquartered in DC.

LeoSat is working to launch the network in tandem with Thales Alenia Space, and envisages between 78 and 108 LEO satellites linked to each other optically, but with high-power microwave downlinks to terrestrial stations.

Back in 2016 Thales Alenia Space, which is majority-owned by the France-headquartered defense giant Thales,

acquired the optoelectronics business previously owned by Swiss engineering firm RUAG – giving it direct access to the technology needed for inter-satellite terminals. LeoSat says that each satellite “node” will feature four optical links.

Partly aimed at customers in the financial sector, the high-speed network is expected to offer faster speed than even a fiber-optic terrestrial link – with LeoSat touting a latency of just 119 milliseconds for a signal to reach Singapore from London.

Unlike other developers of high-speed LEO networks, LeoSat is not aiming the capability at the wider public, instead choosing to focus on the business-to-business sector.

The company, which is believed to be seeking \$100 million in a series A round of venture funding, has scheduled satellite launches starting in 2021, with the first full worldwide service expected to become available a year later.

<http://optics.org/news/9/3/16>

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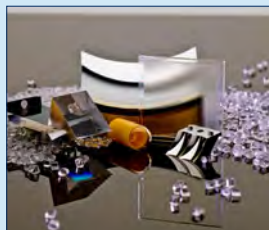
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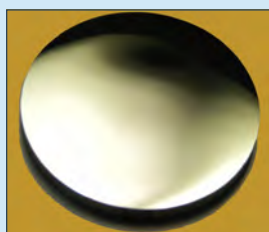
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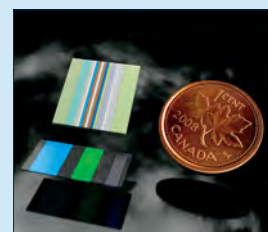
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Artemis signs development deals with Metamaterial and Plessey

UK maker of optical thin-films providing expertise for augmented-reality head-up displays and laser threat protection.

Artemis Optical, the UK-based manufacturer of thin-film coatings for photonics applications, has signed separate development deals with its near neighbor Plessey Semiconductors and Canada's Metamaterial Technologies (MTI).

The partnership with LED company Plessey will see the two companies – both based near Plymouth in the southwest of England – working on a new approach to augmented reality (AR) head-up displays (HUDs).

This project will combine Artemis' expertise in designing and manufacturing thin-film coatings for HUDs with Plessey's patented monolithic microLED gallium nitride-on-silicon (GaN-on-Si) technology.

Plessey unveiled the GaN-on-Si microLED approach at the recent Consumer Electronics Show (CES) in Las Vegas. Its CTO Keith Strickland claimed during the event: "Monolithic microLED technology using GaN-on-Si is the only viable solution that can enable products that are not only compact enough to be worn without restricting the overall experience for AR and VR applications and in HUDs, but also provide the size, weight, power and luminance needed."

Monolithic approach

The LED technology developer is pursuing an extensive licensing program for the GaN-on-Si approach, and is aiming to manufacture the first fully monolithic microLED display.

The company explains that one of the main challenges in making such displays with a non-monolithic approach is the placement of LED chips onto a CMOS backplane, which demands a pick-and-place approach.

"This involves the individual placement of every LED on a pitch of less than 50µm, requiring new and expensive equipment that is subject to productivity issues," states Plessey. "As the pixel density of displays increases and pitch reduces, pick-and-place becomes less feasible both commercially and technically."



Photo: Plessey Semiconductors.

Plessey claims that the monolithic approach that can be used to make its GaN-on-silicon microLED displays has an inherent advantage over current "pick-and-place" methods. It showed off the technology at the recent CES event in Las Vegas.

Adopting the monolithic process would remove and need for chip placement and, it is claimed, will enable smaller and higher-resolution displays for virtual and augmented reality (VR/AR), and HUDs.

"As the only monolithic solution commercially available, Plessey's technology doesn't require pick-and-place equipment and isn't subject to the associated productivity issues," adds the firm.

"GaN-on-Si is the only technology that makes sense in terms of scalability and performance," said Strickland during the Las Vegas trade show. "It offers better thermal conductivity than sapphire and higher luminosity than OLED [organic LED], which is why this technology is widely acknowledged to be the only one that can deliver high-resolution, high-luminance displays."

Plessey's CEO Michael LeGoff added: "Working with Artemis on this solution has put us across a cultural chasm, by bringing together the HUD technology, most widely used for defense applications, and our microLED expertise to benefit the augmented reality industry."

Metamaterials laser protection

Artemis' deal with MTI, which is headquartered in Halifax, Canada, but has an office in London, UK, will see the two firms partner on a hybrid coating for defense applications.

"The companies are pairing up to harness both of their innovative thin-film coating technologies, to create a brand new, hybrid meta filtering solution to combat laser threats for the users of periscopes and sighting systems in armored vehicles," explained Artemis.

It predicts that the combination of Artemis' thin-film deposition expertise and MTI's metamaterials will result in better laser protection filters than are currently available. Artemis is qualified to supply the US military with laser protection filters, and has also provided the UK's Ministry of Defence with the technology for all of its front-line armored vehicles, as well as their equivalents in Norway and France. In 2016 the company signed a major deal with defense giant BAE Systems that is helping to fund a significant expansion.

MTI's CEO and founder George Palikaras said of the development deal: "We look forward to combine MTI's strength in flexible, large-scale filters with Artemis Optical, [which] is an established leading supplier in optical thin-film coatings, to develop the next generation of laser filters. The combination of our technologies will offer unique capabilities for the defense industry globally."

Artemis' sales director Jamie Pindard added: "We're very excited about this high-tech collaboration. Both companies have already proved their technology in their respective fields. The potential of these new hybrid solutions could prove to be a step-change in the way that the industry considers the possibilities of laser protection."

<http://optics.org/news/9/1/26>

SPIE appoints Kent Rochford as new CEO

Former NIST top executive brings broad research, technology, and leadership experience; to replace retiring Eugene Arthurs.

SPIE, the international society for optics and photonics, has announced that Dr Kent Rochford is to be the organization's new CEO. A strong technical background in the field of optics paired with a long career in organizational management and advocacy of scientific research makes Dr. Rochford the ideal candidate to follow Eugene Arthurs, who will retire from SPIE on June 2.

Most recently, Dr Rochford, a longtime SPIE member, was associate director for Laboratory Programs at the US National Institute of Standards and Technology (NIST), providing direction and operational guidance for NIST's scientific and technical laboratory programs with 2,800 staff and an \$800 million budget. In this role, he represented the full breadth of laboratory activity to domestic and international constituencies, collaborators, stakeholders, the US Congress, and advisory boards.

Dr Rochford previously headed up NIST-Boulder Labs and the Communication Technology Laboratory in Colorado, utilizing measurement science to assist first-responder communications and spectrum-sharing and advanced communications technologies, as well as supporting the National Advanced Spectrum and Communications Test Network.

He has also served as chief of both the Quantum Electronics and Photonics and Optoelectronics Divisions at NIST, as well as acting director of the Electronics and Electrical Engineering Laboratory.

"I am honored and grateful for the opportunity to lead this exceptional organization during such an exciting

time for optics and photonics," said Dr Rochford. "I look forward to working with the SPIE Board, leadership, staff, and I'm thrilled to be part of SPIE's efforts to advance this extraordinary field."

Dr Rochford originally joined NIST in 1992 as a postdoctoral research associate, working on measurements and standards for sensing and communication. Between 2000 and 2002, he managed the engineering department of a startup optical-communications company, working on components for high-performance communication systems. On his return to NIST, he led the Electronics and Electrical Engineering Laboratory Optoelectronics Division between 2003 and 2008.

He holds a PhD in optical sciences from the University of Arizona, a BS in electrical engineering from Arizona State University, and an MBA from the University of Colorado.

'Enhancing SPIE's mission'

"I am very delighted to welcome Kent as leader of the SPIE team," said SPIE President Maryellen Giger. "His many years of working with the science of optics and its real-world applications, as well as his strengths in strategic planning, operational oversight, and organizational management, will enhance SPIE's ongoing mission.

"I have full confidence that he will be instrumental in ensuring that SPIE continues to lead in our exciting field, and I look forward to working with him this year, as well as into the future. As Kent takes over leadership of SPIE, I want to acknowledge and greatly thank our retiring current CEO, Dr. Eugene Arthurs. Eugene's vision and endless efforts have



Photo: SPIE

New SPIE CEO Dr Kent Rochford.

strategically and continuously grown SPIE as the international leader in photonics and optics."

Dr Arthurs added, "With his long involvement in the optics and photonics community, as well as the critical experience of applying the science to impactful, robust solutions useful to industry, Kent will be a terrific asset for SPIE in its global efforts. I look forward to his leadership of the SPIE staff and the outstanding work they do for the SPIE community as we strive together to further our understanding of our universe and improve lives using the extraordinary and versatile gift of light."

- SPIE is the owner and publisher of optics.org.

<http://optics.org/news/9/4/10>

VLT's interferometer upgrade probes Betelgeuse

'MATISSE' system combines mid-infrared wavelengths captured by up to four different telescopes, providing astronomers with unprecedented image detail.

Astronomers working with the Very Large Telescope (VLT) at the European Southern Observatory (ESO) have begun using a new piece of optical equipment that will yield unprecedented insights into the formation of massive stars and exoplanet atmospheres.

The Multi AperTure mid-Infrared SpectroScopic Experiment (MATISSE) is an interferometer that combines mid-infrared light collected by up to four different telescopes. In doing so, it generates the imaging power of a 200 meter-diameter telescope – an order of magnitude larger than any current or planned instrument.

Walter Jaffe and Gerd Weigelt, who are co-principal investigators on the project, said in an ESO release: "MATISSE will give us dramatic images of planet-forming regions, multiple stars, and, when working with the VLT Unit Telescopes, also the dusty discs feeding supermassive black holes."

They added: "We hope also to observe details of exotic objects in our Solar System, such as volcanoes on Io, and the atmospheres of giant exoplanets."

Beam combiner

The optics of the interferometer system comprise a four-way beam combiner, which can be used in conjunction with both the 8.2 meter-diameter VLT "unit telescopes," and the smaller (1.8 meter diameter) auxiliary telescopes at the Paranal Observatory in Chile.

The system was developed over 12 years by engineers and astronomers in France, Germany, Austria, the Netherlands and

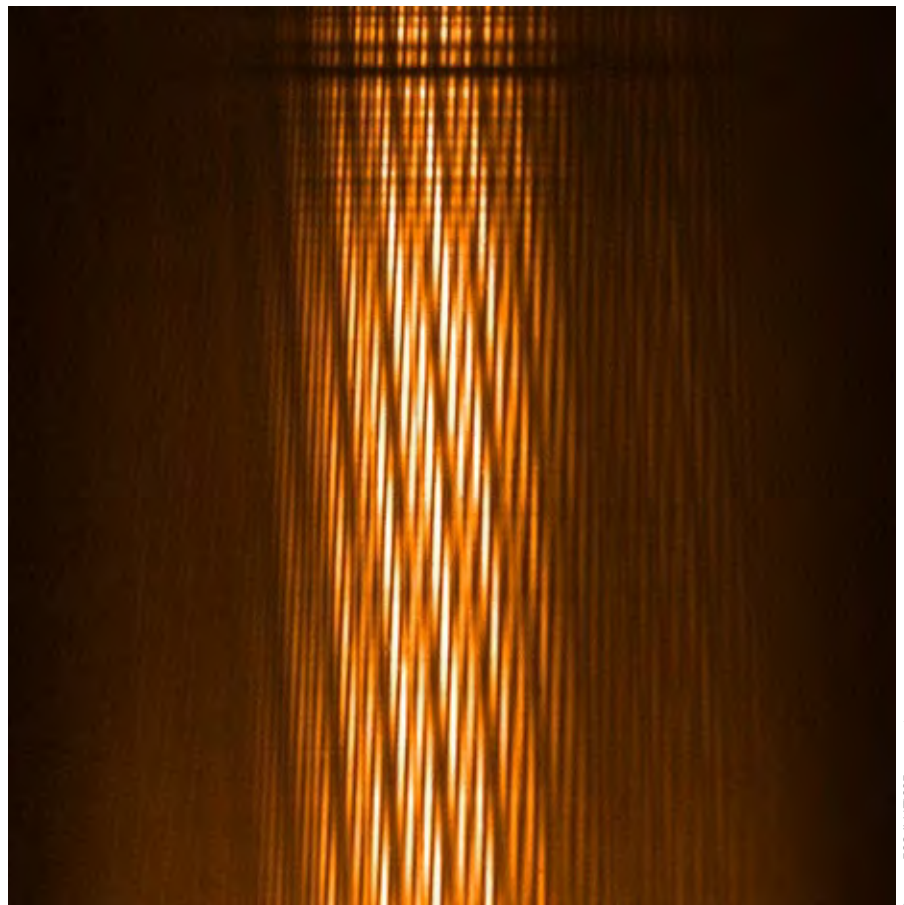


Image: ESO/MATISSE consortium.

Said to be the most powerful interferometric instrument in the world at mid-infrared wavelengths, this MATISSE-generated image shows the result of interfering the light captured by the four VLT "auxiliary" telescopes at the ESO's Paranal Observatory in Chile.

ESO. Following an extensive period of demanding work installing and testing the complex instrument, initial observations – including studies of the well-known red giant star Betelgeuse in the constellation Orion – have confirmed that MATISSE is working as expected.

Betelgeuse is expected to explode into a supernova in the relatively near future (the next few hundred thousand years),

and the early MATISSE observations have shown evidence that the star appears to be a different size when viewed at different wavelengths. "Such data will allow astronomers to further study the huge star's surroundings and how it is shedding material into space," ESO said.

The MATISSE project's principal investigator

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VLT's interferometer upgrade probes Betelgeuse

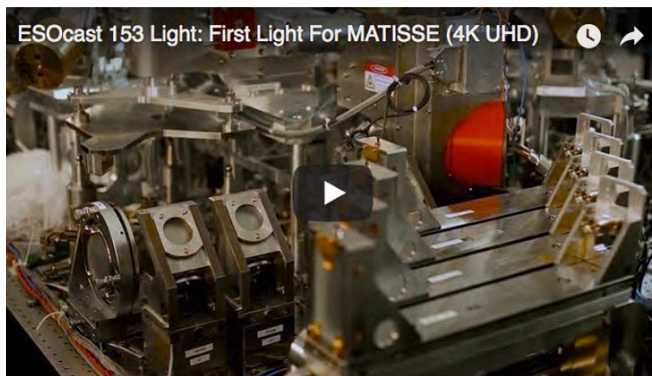
is Bruno Lopez, from the Observatoire de la Côte d'Azur in Nice, France. Explaining the optical principles behind the unique power of the equipment, he said:

"Single telescopes can achieve image sharpness that is limited by the size of their mirrors. To obtain even higher resolution, we combine - or interfere - the light from four different VLT telescopes."

Optical power

This power is said to deliver the sharpest ever images from any telescope in the 3-13 μm wavelength range, something that will complement future observations made by the James Webb Space Telescope after its planned launch next year.

Thomas Henning, director at the Max Planck Institute for Astronomy (MPIA) in Heidelberg, Germany, and another of the MATISSE project's co-principal investigators, added: "By looking at the inner regions of protoplanetary discs with MATISSE, we hope to learn the



First light for MATISSE: official ESO video.
<https://www.youtube.com/watch?v=mymAXxwqyXY>

origin of the various minerals contained in these discs - minerals that will later go on to form the solid cores of planets like the Earth."

The system is based on the principle of "optical long-baseline interferometry", where signals from multiple telescopes are combined, and similar approaches have previously been used with radio telescope arrays.

While the approach is generally limited to observations of relatively bright objects - like Betelgeuse - the VLT configuration should extend the sensitivity to the level needed for studies of active galactic nuclei and protoplanetary discs.

The full optical design, details of which can be viewed here, includes a series of beam splitters, cold stops, and camera lenses.

Among the contractors involved in the development of the interferometer system were Grenoble-based ALPAO, whose rapidly deformable mirrors play a key role in correcting for atmospheric distortion.

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US Navy awards Lockheed Aculight \$150M laser weapon contract

Deal could increase in value to nearly \$1 billion if all options are taken up.

Lockheed Martin's Aculight division, which develops high-power fiber lasers for military applications, has won an initial \$150 million contract to build a laser weapon and dazzler system.

Awarded by the US Navy, via a project called "Navy Laser Weapon System Increment 1", the contract will see Aculight develop, build, and deliver two laser test units in fiscal year 2020 – one for a DDG 51" class US Navy destroyer, and a second for land-based testing.

HELIOS

The laser equipment is referred to as the High Energy Laser and Integrated Optical-dazzler with surveillance system, or "HELIOS" for short.

The value of contract could increase dramatically, with the US Department of Defense (DoD) announcing: "This contract includes options which, if exercised, would bring the cumulative value of this contract to \$942,818,114."

That DoD note specifies that just over half the value of the work will be performed in Bothell, Washington, where the Aculight division is based, with the bulk of the remainder in Moorestown, New Jersey. The anticipated completion date is April 2020.

The latest award comes just a few months after the Lockheed division won a \$26.3 million contract to lead a project adapting a high-power fiber laser weapon for use on board a fighter aircraft.

Spectral beam combining

Lockheed's experience in the development of laser weapon systems



Photo: Lockheed Martin

This image of a destroyed truck, released by Lockheed in 2015 and said to be the result of its 'ATHENA' 30 kilowatt fiber laser weapon, indicates the kind of damage that such a source can inflict. Around 100 kilowatt output is thought necessary for a full-fledged military-grade weapon.

goes back more than 40 years and includes the 30 kW-class ATHENA (Advanced Test High Energy Asset) and ALADIN (Accelerated Laser Demonstration Initiative) systems, as well as participation in the Robust Electric Laser Initiative (RELI).

That expertise stepped up a gear a decade ago, when the defense contractor giant acquired Aculight – at the time a small, privately owned venture that had grown to employ around 90 people since being founded in 1993.

Aculight is known to have developed spectral beam combining technology,

where several high-power beams emitting at slightly different wavelengths are combined to ramp up the overall power of the weapon. Four years ago the firm's engineering team delivered a 30 kW prototype based on this approach, with 100 kW generally regarded as the power needed for an effective laser weapon.

The Aculight division also develops scientific lasers, and its "Argos 2400" optical parametric oscillator source was shortlisted for the 2014 Prism Awards.

<http://optics.org/news/9/2/3>

Spectral Engines develops portable IR drug analyzer for police

€2.4 million in EU funding granted for productization of scanner developed by VTT spin out company.

Spectral Engines, a spin out from the VTT Technical Research Centre of Finland, is set to launch a portable drug screening device police patrols can use for rapid and cost-efficient on-site screening of suspected drugs.



Photo: Spectral Engines

Set for commercialisation: Spectral Engine's narcotics scanner.

The pocket-size scanner displays the results in the operator's mobile phone in a matter of seconds. Spectral Engines says that there is significant international demand for such an innovation - based on infrared radiation - which explains why a total of €2.4 million in EU funding was granted for the device's productization.

The small device, which weighs only a few hundred grams, will "change the future of police work in war on drugs", commented Spectral Engines. Besides being the first pocket-size drug screening device available for field work, the tungsten lamp-based device is also more than 20 times cheaper than other devices in current use, which often rely on Raman technology.

Spectral Engines's CCO Janne Suhonen commented, "Our drug screening device is significantly smaller than the competing ones currently on the market. It is designed for field work and it uses the mobile phone as its user interface. Devices are cloud-connected which enables easy machine learning-based application algorithm development for different drugs."

Cocaine, heroin and amphetamines

The scanner allows an accurate and reliable identification of such drugs as cocaine, heroin and amphetamine from very low drug concentrations. As required, the multi-purpose device's identification algorithms can be updated to identify various "designer drugs", such as MDMA (Ecstasy), ketamine, GHB, Rohypnol, and LSD (acid), as well.

In addition to police use, the scanner is also suited for the use of customs officers, military and other similar organisations, for whom it can be important to identify unknown and potentially illegal substances.

The technology of the device created in the NarcoScan project is based on infrared spectroscopy and the MEMS technology studied at VTT. Suhonen added that the first products are likely to enter market in the spring of 2018.

"The competitive funding from the EU

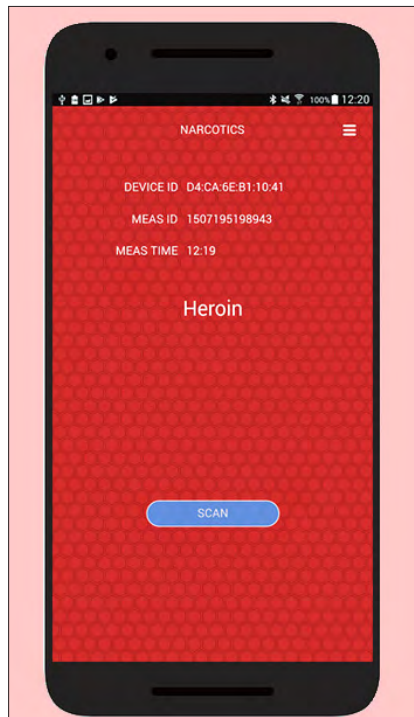


Photo: Spectral Engines

Measurements are displayed by a standard mobile phone handset.

Horizon 2020 programme guarantees that we can proceed rapidly from the first prototype to mass production, and allows us to assign several man-years of labor on this productisation project. We will be able to launch the first products next spring, and early in 2018 we will also begin field testing the device with our first pilot customers," he said.

During the scanner's development, the company has already collaborated with leading criminal laboratories worldwide, and its research partners come mainly from the United States and Europe. The EU funding enables expanding the cooperation to various new laboratories for the development of model libraries.

NIR One

Spectral Engines' NIRONE sensors work at the true near infrared (NIR) spectral range from 1350 to 2450 nm which means better sensitivity and specificity in material sensing applications. These sensors are said to offer "excellent performance, fully comparable to the best laboratory instruments in a small package and only a fraction of the cost".

The NIRONE sensors are primarily designed for system integrators for creating optical scanning systems. Compact NIRONE Sensors include two integrated light sources, NIR sensor, read-out and driving electronics and built-in intelligence, which makes for stable outputs even in the most demanding industrial or consumer applications. The spectral sensor can easily be adapted to diverse measurement needs with suitable front optics.

The associated NIRONE Evaluation Kit provides a basis for technology evaluation and application studies. The evaluation kit includes a USB communication board and the sensor can be controlled via PC by using dedicated SensorControl software. Spectral Engines stated, "The evaluation kit is the easiest and fastest way to start your NIR application studies right away. Our SensorControl software is free to use with any of our devices."

<http://optics.org/news/8/10/47>

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