

LAMPIRAN 1
BERITA HARIAN (WILAYAH) : MUKA SURAT 58
TARIKH : 23 APRIL 2018 (ISNIN)

JAS ambil sampel kaji punca air sungai jadi hijau

Kuantan: Jabatan Alam Sekitar (JAS) Pahang sudah mengambil sampel air di Sungai Aur, Muadzam Shah, Rompin bagi mengenal punca menyebabkan air sungai itu menjadi hijau.

Pengarahnya, Rosli Zul, berkata sampel air sungai itu sudah dihantar ke **Jabatan Kimia** negeri untuk dianalisis dan keputusan akan diketahui dalam tempoh se-kurang-kurangnya sebulan lagi.

"Setakat ini, kita perlu menunggu keputusan analisis sampel air Sungai Aur terlebih dahulu untuk menentukan tindakan seterusnya. Kita juga difahamkan terdapat ak-

tiviti perlombongan di kawasan hulu sungai berkenaan.

"Namun, kita belum dapat pastikan sama ada air bertukar warna hijau ini berpunca daripada aktiviti perlombongan," katanya ketika dihubungi, di sini, semalam.

Sementara itu, seorang penduduk Kampung Aur, Muadzam Shah, Ahmad Rizal Abdul Hani, 39, berkata masalah itu sudah berlarutan lebih dua minggu dan membimbangkan penduduk sekitar.

"Sebelum ini, air sungai berke-
naan keruh dan tidak pernah ber-
warna seperti ini. Malah, ada juga
penduduk kampung mendakwa



Air Sungai Aur di Muadzam Shah berubah menjadi warna hijau.



Rosli Zul

berlaku ikan mati dan beberapa hidupan marin di situ," katanya.

Harap masalah selesai

Beliau berharap masalah itu diselesaikan segera kerana air Sungai Aur adalah sumber bekalan air mentah bagi penduduk sekitar Muadzam Shah.

"Penduduk Kampung mendakwa masalah ini berpunca daripada Sungai Jeram yang terletak di hulu, cuma tak pasti apa yang berlaku di sana hingga menyebabkan keadaan ini.

"Kami sayangkan sungai ini dan hidupan di dalamnya seperti

udang galah serta pelbagai jenis ikan," katanya.

Ahmad Rizal juga mahu hasil keputusan analisis sampel air itu dimaklumkan kepada penduduk setempat dan orang ramai, serta mengenakan tindakan kepada pihak yang bertanggungjawab menyebabkan keadaan itu berlaku.

"Jangan tunggu bila sudah berlalu apa-apa kes besar baru semua kecoh turun padang nak buat itu ini.

Perlu ada tindakan segera, bukan bila sungai sudah rosak baru hendak fikir kaedah mengatasinya," katanya.

LAMPIRAN 2
HARIAN METRO (NUANSA) : MUKA SURAT 31 & 35
TARIKH : 23 APRIL 2018 (ISNIN)



MEMBURU SUPERSTAR SAINS

Petrosains, The Discovery Center sekali lagi memburu 'superstar' sains negara dalam kalangan pelajar sekolah menengah menerusi program Petrosains Science Show Competition 2018.

Memasuki tahun ke-10, pertandingan sains dan seni persembahan anjuran Petrosains itu bertujuan mendedahkan sains serta mempromosikan kaedah pembelajaran menarik lagi berkesan kepada pelajar.

> N35

8 REBUT HADIAH UTAMA

DARI MUKA N31

Juara berpeluang menangi wang tunai lebih RM40,000

Pertandingan itu juga disokong Bahagian Kokurikulum dan Kesenian Kementerian Pendidikan serta Bank Islam sebagai rakan kongsi kewangan.

Peserta pertandingan dikehendaki membentangkan konsep saintifik dan mempamerkan percubaan atau demonstrasi untuk menggambarkan konsep diberikan sama ada secara individu atau dalam pasukan bagi tempoh 15 minit.

Seramai 10 peserta teratas akan bertanding di negeri masing-masing ketika pusingan peringkat negeri.

Sementara lapan juara di peringkat negeri pula akan bertarung untuk hadiah utama dalam pertandingan akhir yang dijangka diadakan pada Oktober ini.

Juara berpeluang memenangi hadiah wang tunai lebih RM40,000 dan hadiah utama tajaan lawatan ke China Science Technology Museum di Beijing. China bernilai



PERTUNJUKAN ujian berkenaan sains antara yang dipersembahkan.

on koleks E, Kementerian Pendidikan Malay
 27 Oktober 2016



IDEA yang bernas perlu ditonjolkan.

RM30,000.

Sekolah dengan bilangan penyertaan paling banyak juga akan memenangi wang tunai.

Pertandingan ini juga akan disiarkan di rancangan TV Pendidikan dan hiburan Astro TVIQ saluran 610.

Guru dan pelajar yang ingin menyertai

boleh mengemukakan penyertaan hingga tarikh tutup pertandingan pada 31 Mei ini.

Borang penyertaan boleh diperoleh dari laman web. Untuk maklumat lanjut sila layari www.petrosains.com.my/science-show-competition/. Fazurawati Che Lah

LAMPIRAN 3
UTUSAN MALAYSIA (MEGA SAINS) : MUKA SURAT 22
TARIKH : 23 APRIL 2018 (ISNIN)

Teknologi pertanian tepat bantu pesawah

BERAS bukan sahaja merupakan makanan ruji rakyat Malaysia tetapi ia telah termasuk dalam lingkungan sekuriti makanan. Pelbagai inisiatif wajar diambil bagi mengatasi beberapa masalah dalam memastikan krisis kekurangan bekalan tidak terjadi di negara ini seperti kehilangan lepas tuai yang menyebabkan bilangan padi menjadi kurang ketika proses menghasilkan beras.

Perdana Menteri, Datuk Seri Najib Tun Razak semasa berucap pada majlis Pelancaran Bantuan Khas Pesawah Peringkat Kebangsaan di Pusat Pertumbuhan Desa Sungai Korok, Jerlun, Kedah baru-baru ini menyatakan komitmen akan terus menjaga kebajikan pesawah.

Beliau juga berhasrat untuk menaikkan jumlah bantuan khas kepada golongan tersebut sebagai menghargai jasa mereka.

Antara usaha yang dilakukan termasuklah memberi subsidi dan insentif kepada pesawah padi berjumlah RM1.69 bilion dan subsidi baja bernilai RM465 juta untuk tahun ini.

Di bawah Bidang Ekonomi Utama Negara (NKEA) dalam sektor pertanian kerajaan meluluskan peruntukan berjumlah RM2.7 bilion sepanjang tempoh 2011 hingga 2020 untuk membangunkan sistem pengairan di kawasan Lembaga Kemajuan Pertanian Muda (MADA).

Dengan adanya insentif tersebut, projek berkenaan mampu mencapai sasaran hasil purata padi sebanyak lapan tan setiap hektar berbanding 6.19 tan sehektar buat masa ini sekali gus akan meningkatkan pendapatan per kapita keluarga pesawah kepada RM48,000 setahun.

Justeru bagi merealisasikan perkara itu, Institut Penyelidikan dan Kemajuan Pertanian Malaysia (MARDI) menjalankan kajian bagi membolehkan keuntungan pesawah mencapai tahap maksimum.

Kajian yang bermula sejak Rancangan Malaysia Kelapan (RMK-8) memasuki proses pra pengkomersialan pada RMK-11.

Timbalan Pengarah Program Pertanian Tepat, Pusat Penyelidikan Kejuruteraan MARDI, **Dr. Mohd. Syaifudin Abdul Rahman** dan

PERBANDINGAN MESIN DAN MANUSIA

Penaburan benih	Mesin	Manusia
Operasi (ha/jam)	2.73	1.5
Variasi lapangan (%)	5-10	22-30
Kapasiti (kg)	300-500	25
Jarak taburan (m)	14-16	8-10

kumpulannya memperkenalkan pakej teknologi pertanian tepat.

Pertanian tepat merupakan teknologi yang berasaskan maklumat dalam sistem pengurusan pertanian yang menggabungkan amalan pertanian yang sesuai bagi mengurus kebolehan ubahan di ladang untuk memastikan keuntungan yang optimum, meningkatkan produktiviti dan pengeluaran pertanian mampan.

Penggunaan teknologi pertanian tepat dalam pengeluaran padi dapat meningkat dan menggalakkan operasi komersial berskala besar dalam bentuk sistem perladangan berkelompok atau estet. MARDI berjaya membangunkan pakej teknologi pertanian tepat yang terdiri daripada tiga teknologi.

Tambah Mohd. Syaifudin, beberapa elemen penting digunakan dalam pembangunan sistem amaran awal perosak bena perang dan penyakit karah bagi memastikan tanaman padi memperoleh hasil yang tinggi.

Jelasnya, setiap sawah padi di kawasan terpilih akan dipantau menggunakan beberapa komponen teknologi yang merangkumi perangkap cahaya modular dan sistem pengenalan pastian serangga secara automatik, pemetaan pemantauan tanaman melalui UAV, model serangan bena perang dan penyakit karah, pangkalan data cuaca dan pangkalan data amalan penanaman petani dan diselaraskan melalui sistem pemantauan bersepadu (AGRIIS) yang berpusat di MARDI

Seberang Perai.

Mesej amaran awal dalam bentuk mesej pesanan ringkas (SMS) atau menggunakan aplikasi tertentu akan dihantar kepada penyelia atau petani sawah untuk memberi tahu adanya serangan agar tindakan selanjutnya boleh diambil secara segera dan betul.

"Sistem pengurusan informasi ladang yang cekap ini membolehkan sebarang aktiviti di sawah dipantau agar dapat mengurangkan risiko yang mengganggu penghasilan padi yang berkualiti," ujarnya.

Melalui kerjasama dengan pihak MADA dan Pertubuhan Peladang Kwasan (PPK) Sungai Limau Dalam plot kajian peningkatan skala dilakukan di sebuah estet padi (10 hektar) di Batu 17, Yan, Kedah pada 2016 dan 2017 berjaya menampilkan hasil yang baik.

Justeru itu, Mohd. Syaifudin dan pasukannya sekali lagi terus melaksanakan projek peningkatan skala teknologi pertanian tepat pada tahun ini sehingga 2020 di Felcra Seberang Perak dengan keluasan sawah seluas 60 hektar.

Ciri utama dalam teknologi pertanian tepat

- Memerlukan petani dan pengusaha menggunakan input yang optimum.
- Mengurangkan penggunaan bahan kimia yang berlebihan serta mengurus nutrien di kawasan yang bermasalah dengan baik.
- Mekanisasi dan automasi pelbagai peringkat teknologi dapat mengurangkan penggunaan tenaga buruh, lebih mesra alam, dengan jangkaan faedah keuntungan yang

Ciri-ciri utama Penggunaan Teknologi Pertanian Tepat

1 Operasi komersial berskala besar (sistem perladangan berkelompok atau estet).

2 Input yang optimum.

3 Kurang bahan kimia (mesra alam).

4 Pengurusan nutrien yang baik (nutrien spesifik).

5 Mekanisasi dan automasi pada pelbagai peringkat aktiviti penanaman (kurang tenaga buruh, galakan petani muda).

optimum melalui pengurangan input ladang dan penjimatan kos operasi.

Pakej teknologi MARDI

- Sistem perataan tanah dan penaburan benih secara kadar boleh ubah (VRT).
- Sistem pembajaan secara kadar boleh ubah
- Sistem amaran awal bagi perosak (bena perang) dan penyakit karah padi.
- Menerusi pakej tersebut, membolehkan kerja-kerja pemetaan index perataan tanah dapat dilakukan secara automatik dan efisien.
- Pemetaan index perataan tanah membolehkan penaburan benih dilakukan menggunakan mesin secara kadar boleh ubah bagi memastikan penapakan pokok padi yang baik dan seragam, untuk memperoleh hasil tinggi.
- Pakej ini menjimatkan penggunaan baja diijamatkan sebanyak 15 hingga 25 peratus melalui penggunaan sistem pembajaan secara kadar boleh ubah (VRT).
- Penggunaan mekanisasi dan automasi sekali gus mengurangkan tenaga buruh sehingga 50 peratus bagi aktiviti penaburan benih dan pembajaan melalui teknologi VRT.
- Meningkatkan kecekapan pengesanan kebarangkalian berlakunya wabak bena perang serta penyakit karah untuk padi sebanyak 50 peratus di kawasan terpilih khususnya di kawasan jelapang.



DR. MOHD. SYAIFUDIN ABDUL RAHMAN

G3 Global to release new IoT products for S-E Asian market

By DAVID TAN
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GEORGE TOWN: G3 Global Bhd will release new Internet-of-things (IoT) products for the South-East Asian market in the second half of 2018 to tap into the IT market.

Group executive director Lim Boon Hong told *StarBiz* that the IoT products came in the form of sensor hubs with embedded systems that can be used for smart farming to transmit data from any sensors to remote servers via various connectivity options such as LoRa, NB-IOT and 4G. "The product will help farmers increase agricultural yields and optimise resources for smart farming," he added.

"Another IoT product is the Connected ADAS (Advance Driver Assistance Systems) solution, which provides continuous monitoring of vehicles and its surroundings, automatically alerting drivers when dangerous conditions are detected.

"Through this early warning system, drivers would be able to immediately take corrective actions to prevent collisions and accidents, thus reducing loss of lives and assets," Lim said.

According to Lim, these new IoT products are now on a trial run by customers and will be launched in the second half of the year, targeting mainly customers in the South-East Asian market, as well as other parts of the world. "The IoT business should contribute to our revenue in the second half of 2018, which we expect to be the group's key driver in the future.

"The IoT segment is not a capital-intensive industry. So far, we have invested more than RM5mil in designing and developing the IoT platform. The group is also developing IoT-related prototypes and minimum viable products for specific industry needs and use case," Lim said.

On G3 Global's apparel business, Lim said the industry was still facing challenges due to the slow market conditions in the country that have resulted in weakening consumer confidence.

"Rising prices for food and essential items have driven up the cost of living. Consumers are cautious in their spending habits, giving priority to essential items such as food, school expenses over apparel products.

"We are taking measures to lower operating cost and find the best approach to turn around the business.

"Our investment in the IoT business is in its gestation phase," Lim said.

In 2016, Green Packet Bhd acquired a 32% stake in G3 Global, establishing its venture into the ICT business, specialising in IoT solutions with end-to-end delivery of connected devices, IoT networks and data-driven applications.

LAMPIRAN 5
SINAR HARIAN : MUKA SURAT 42
TARIKH : 23 APRIL 2018 (ISNIN)

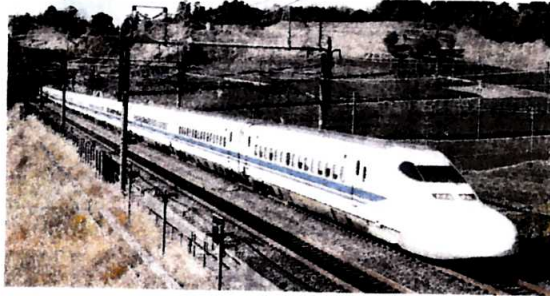
Teruja kemungkinan 'Shinkansen' beroperasi di Malaysia

KUALA LUMPUR -

Kemungkinan sistem kereta api laju terkemuka Jepun, Shinkansen dilaksanakan di Malaysia dan Singapura, mencetuskan keterujaan dalam Persatuan Kereta Api Berkelajuan Tinggi Antarabangsa (IHIRA), dengan pegawai kanannya menyambut baik pelaksanaan itu.

Naib Presiden IHIRA, Torkel Patterson berkata, negara yang sebelum ini tidak mempunyai pengalaman kerja dalam projek kereta api berkelajuan tinggi (HSR), membuktikan mereka mampu mencapai tahap kejayaan yang sama seperti Jepun dalam mengurus sistem itu walaupun wujud keraguan. Beliau memetik Taiwan dan New Delhi sebagai contoh.

Pendekatan Sistem Menyeluruh Shinkansen kepada HSR mengintegrasikan teknologi infrastruktur dengan lancar, dengan kelebihan utamanya pendekatan melatih pekerja untuk menyelenggara



dan melaksana sistem berkenaan.

"Teknologi perkakasan dan perisian yang disepadukan dalam sistem menyeluruh itu menyumbang kepada populariti Shinkansen iaitu perkhidmatan yang selamat, pantas, boleh dipercayai, tepat pada masanya dan kerap," katanya.

Patterson menyenaraikan tiga ciri yang membawa kepada kejayaan sistem Shinkansen apabila dieksport keluar dari Jepun - latihan, kepimpinan tempatan yang hebat dan sokongan dan

galakan orang awam.

"Ramai yang tertanya-tanya mungkinkah Shinkansen boleh beroperasi ke negara-negara lain dan sama ada negara tersebut dapat mencapai kejayaan yang sama seperti di Jepun. Jawapannya memang boleh," kata Patterson.

Mengenai kepimpinan tempatan, beliau berkata, kepimpinan kukuh dalam sistem Malaysia-Singapura penting kerana, tanpa komitmen, visi dan pandangan positif, tidak akan tercapai, dan pada masa yang

Ramai tertanya-tanya mungkinkah Shinkansen boleh beroperasi ke negara lain dan sama ada negara tersebut dapat mencapai kejayaan sama seperti di Jepun. Jawapannya memang boleh." - Patterson

sama, semuanya boleh berlaku.

Menyentuh mengenai sokongan orang ramai, beliau berkata: "Orang ramai, sebaik mereka mempunyai peluang merasai HSR, jatuh cinta dengannya dan mahukannya. Sokongan ini akan meyakinkan ahli politik yang mungkin pada peringkat awal bimbang mengambil risiko ini. Dengan memiliki pengangkutan popular juga akan meningkatkan jumlah penumpang dan bantu pembangunan berasaskan transit (TOD)."

Di Jepun, TOD menyumbang 20 hingga 40 peratus daripada keseluruhan perniagaan, didorong oleh hakikat bahawa syarikat kereta api memiliki tanah segera di sekitar stesen dan boleh bangunkannya di atas, di bawah

dan di sekitar stesen.

Di Malaysia, Patterson melihat cadangan stesen terminal di Bandar Malaysia di Kuala Lumpur, Bandar Nusajaya di Johor dan Jurong East di Singapura, akan berjaya sejak awal lagi, manakala stesen lain akan berkembang selari pertumbuhan penumpang.

"Hampir kesemua kepakaran untuk TOD sudah pun wujud di Malaysia. Kuncinya ialah kepimpinan dan pekerja utama mereka perlu melawat Jepun dan melihat piawaian pembinaan, kebersihan dan penyelenggaraan, dan menjadikan piawaian yang tinggi ini sebagai standard Malaysia," katanya. - Bernama

Engineering technology dominating 4th IR

AN unpredictable and unprecedented technological change is looming with the advent of the [4th IR] 4th Industrial Revolution.

Universities, as the nation's education nerve centre, are at the core of modulation. They must adapt and grow to be in tandem with the 4th IR which doubtlessly involves advanced digital automation technology, or they can remain ignorant and dormant, thus approaching extinction.

Advancing into a much anticipated future of a technologically sophisticated, wired-up and highly-complex industrial era, Universiti Teknikal Malaysia Melaka (UTeM) is all geared up towards ensuring a future workforce who is highly skilled but also industry-ready.

Through the Faculty of Engineering Technology (FET), the future is backcast. Tasked with a specific mission and foreseeing robust technological advancements, and with a mandate by the Higher Education Ministry to prepare more 'shopfloor' engineers or better known as technologists, a humble intake of just 300 students in 2011 has now grown to 3,000 students.

The Dean of FET, Assoc Prof Mohd Rahimi Yusoff when met recently asserted that FET has specifically placed its focus on developing engineering graduates who are industry-ready.

At FET, students are taught differently. As they are customised for the needs of cutting-edge industries, the curriculum design and programmes are also prepared fully based on 'industrial needs' concept, which entails 60 per cent of the students' study time spent in laboratories and workshops, or better known as 'teaching factories' with another 40 per cent in lecture rooms.

With three years of graduates totaling 1,601 students, FET proves meritorious with 90 per cent of its graduates being employed within six months com-



The university uses high tech industry-scale equipment to ensure students are equipped with the latest technological and technical know-how.

pletion of their studies.

He said four key elements have led to the high employability success — the syllabus, which is explicitly delineated to the needs of industries; the provision of factory-scaled equipment in the laboratories and 'teaching-factories'; industry-experienced lecturers or teaching engineers and an undeniably sturdy engagement among its staff members.

"We have allocated a substantial amount of budget in providing high-tech equipment at the faculty which includes 101 laboratories and workshops to ensure our students are equipped with the latest technical and technological know-how in preparation for the exponential rate of change brought by the 4th IR.

"This is our top spot and our graduates have gained tremendously from the intensive and consistent exposure to industry-scale training and job technicalities. Every year, we see more than 30 per cent of our students who undertook Industrial Training being offered employment while they were still in training. This is a testimony that our engineering technology graduates are high in demand."



UTeM is committed to producing people who are competitive. Here, lecturers use industrial experience to teach engineers.

"UTeM's slogan 'Always a Pioneer, Always Ahead' is close to our hearts and we shall leave it to our potential stakeholders to evaluate us based on the capabilities of our graduates, who are currently serving and making a difference in the industry," he said, adding that the faculty is currently expanding its scope of technology through the domains of drones and autonomous underwater robotics technology.

"We have to rethink our engineering technology programmes in order to remain relevant. Industry 4.0 will create disruptions in the labour market, eliminating low-skilled or repetitive jobs. This is where FET steps in — we are definitely not going to wait till we cross the bridge we want to be the bridge — to be ahead, we need to rethink and redesign existing programmes. It may be staggering, but this is our call. We are here to ensure that UTeM produces human resources who are competitive and succeed in the fourth industrial revolution."

Meanwhile, FET's Deputy Dean [Industrial Network and Research] Ir. Dr Mohd Farriz Basar said, FET's research ventures and achievements by its faculty members are also substantial to the faculty's soaring reputation.

Challenging is an understatement. "Before any competitions or exhibitions, engagements involves journal writing, industrial relations, patterns or designs with grants that sometimes takes months to disburse and complete, in some cases up to several years. However, with endurance, we have managed to come out victorious in numerous national and international competitions," he said.

Ir. Dr Mohd Farriz has also recently won the Asean Best Practices Award for Renewable Energy Project Competition [Special Submission Category] for the Low Head Low Flow Pico Hydro Generation System with a novel Z-Blade reaction type turbine nomination. The competition was held at the SMX Convention Center, Manila, Philippines in conjunction with 35th Asean Minister on Energy Meeting [35AMEM] and Asean Energy Business Forum [AEBF].

"Other notable research products developed by FET are the Digital Quran which is designed to assist the limless to read because with the Digital Quran, they can flip to the next page by just moving their heads, and the Smart Detector which is worn on the head enabling the person to switch on the lights simply by focusing on the said object. Another product featuring integrated IoT and embedded computing technology with virtual controller from smartphone, the Voice-Assisted Wheelchair also won at the Seoul International Invention Fair [SIIF] held in COEX, Seoul, Korea," he added.

With the 4th IR drawing near, everything gets digitised, customised and smart-mechanised. Once complex tasks will be automated via IoT and Cloud computing. While some will interpret it as the convergence of human and technology, others see it as a threat but at UTeM, specifically the Faculty of Engineering Technology, the IR 4.0 is a boon, opening doors for breakthrough knowledge and envisioning insights.

The Voice-Assisted Wheelchair designed by UTeM also won at the Seoul International Invention Fair (SIIF) held in COEX, Seoul, Korea.



LAMPIRAN 7
MINGGUAN MALAYSIA (LENSA): MUKA SURAT 29
TARIKH : 22 APRIL 2018 (AHAD)

Keunikan astronomi pada Orang Asli

SEPERTI yang kita ketahui, matahari dan planet terbentuk daripada partikel-partikel debu dan gas yang kemudian bersatu dan membentuk gumpalan batu dan ais, lalu berlegar di ruang angkasa.

Inilah dipanggil ilmu astronomi atau Falak dalam Islam. Di alam cakerawala terdapat 88 buruj yang diiktiraf oleh komuniti astronomi antarabangsa, terbentuk daripada sekumpulan bintang yang membentuk formasi di langit. Ia mewakili bentuk-bentuk binatang, manusia, peralatan pertanian dan sebagainya.

Bagaimanapun hanya 12 buruj iaitu yang terletak di lautan matahari sahaja yang digunakan sebagai petunjuk astrologi oleh pemburu kijang dan kancil, petani yang menanam padi huma, jagung, tebu dan ubi kayu serta mereka yang mengambil upah sebagai buruh.

Dalam kalangan Orang Asli Malaysia, ilmu astronomi mereka sangat hebat dan unik kerana ia merangkumi segenap kehidupan



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termasuk kisah legenda dan aktiviti sosial termasuk ilmu perdukunan, pertanian, penternakan serta pelayaran.

Baru-baru ini seramai 30 orang murid Sekolah Kebangsaan Pos Perwor, Sungai Siput (Utara), Perak sangat bertuah kerana diberi peluang mencerap langit untuk melihat sendiri bentuk bintang dan planet yang bertebaran di cakerawala.

Program ilmu Falak untuk masyarakat Orang Asli ini dibawa oleh Kembara At-Taqwa Solution (Kat's) bagi memberi pendedahan kepada mereka mengenai penggunaan beberapa peralatan seperti lensa, teropong dan teleskop yang dibawa oleh pakar astronomi dan juga pemilik Kelab Astronomi Saizwagazer, Dr. Sairin Salleh dari Subang Jaya.



SEORANG murid daripada anak Orang Asli mengambil peluang melihat sendiri bintang dan planet melalui teleskop.



SELAIN aktiviti mencerap bintang, Dr. Sairin Salleh juga menayangkan visual ala mini planetarium agar peserta program merasai sendiri gambaran isi cakerawala.



DR. SAIRIN Salleh (kiri) menunjukkan teleskop untuk aktiviti mencerap langit kepada diperibadikan oleh murid Orang Asli.



Melihat langit malam dari masyarakat Orang Asli mengambil peluang melihat sendiri bintang dan planet melalui teleskop yang diperibadikan oleh Dr. Sairin Salleh.

Misi TESS cari planet untuk penduduk Bumi

→ Ahli astronomi berjaya sahkan wujud lebih 3,000 exoplanet

Oleh Suzan Ahmad
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Beribu-ribu dunia baharu yang mempesonakan ditemui di luar sistem suria kita, daripada planet gas bersaiz gergasi sehingga yang sekecil-kecilnya. Pengarian diteruskan untuk kita memahami dengan lebih baik lagi dunia yang jauh terpisah ini.

Satelit Peninjau Transit Exoplanet atau TESS, milik Pentadbiran Aeronautik dan Angkasa Lepas Amerika Syarikat (NASA) yang dilancarkan 16 April lalu dari Stesen Tertera Udara Cape Canaveral di Florida, akan membantu mengesan exoplanet yang secara relatif lebih dekat dengan Bumi.

Exoplanet adalah planet yang terletak di luar sistem suria yang secara umumnya mengorbit bintang, sama seperti Bumi yang mengelilingi



Kebanyakan exoplanet yang ditemui setakat ini adalah beratus-ratus atau beribu-ribu tahun cahaya jaraknya, dan kita masih belum mempunyai teknologi untuk mengembara ke sana"

NASA

Matahari.

Kebanyakan exoplanet yang diketahui setakat ini dikesan menggunakan kaedah transit, yang mengukur tahap kemalapan bintang bagi menunjukkan sebuah planet sedang melintasi bintang itu.

Satu lagi teknik yang dipanggil halaju radial mencari 'getaran' berulang dalam pergerakan bintang seolah-olah tarikan graviti planet menariknya ke belakang dan ke depan.

Menerusi semua kaedah ini, ahli astronomi berjaya mengesahkan kewujudan lebih daripada 3,000 exoplanet, dan berkemungkinan lebih banyak lagi.

Merentasi ruang angkasa

Exoplanet datang dalam pelbagai saiz dengan ciri-ciri yang menarik. Sebahagiannya adalah planet raksasa yang begitu hampir dengan bintang mereka, sementara yang lainnya adalah dunia

Perbandingan saiz Proxima Centauri



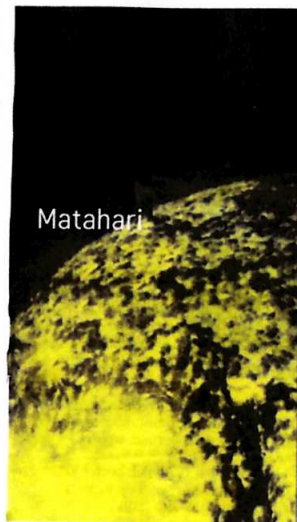
Credit: ESO, B. LUPR/Arcetri, NASA

Misi Exoplanet



TESS diperiksa sebelum propelancarnya oleh jurutera NASA, baru-baru ini.

SAMBUNGAN LAMPIRAN 8 BERITA HARIAN (DUNIA): MUKA SURAT 43 TARIKH : 22 APRIL 2018 (AHAD)



Matahari



Webb
(Belum dilancarkan)

WFIRST
(Belum dilancarkan)

Misi Exoplanet
di masa depan

Pusat
pemerhatian
darat.

yang diliputi ais atau berbatu-batu seperti Bumi.

Terdapat juga tanda-tanda wujudnya 'planet terasing' yang mengembara merentasi ruang angkasa sendirian.

Menurut kenyataan NASA, walaupun kebanyakan exoplanet yang ditemui setakat ini adalah beratus-ratus atau beribu-ribu tahun cahaya jaraknya, dan kita masih belum mempunyai teknologi untuk mengembara ke sana, ahli astronomi masih dapat mengkaji suhu, atmosfera, komposisi dan butiran lain dari jauh, dengan harapan dapat mencari tanda-tanda kemungkinan wujudnya hidupan.

Pada 2016, sebuah planet asing yang hampir sama dengan skala Bumi ditemui berhampiran bintang yang bergiran dengan kita, Proxima Centauri. Ia terletak hanya 4.2 tahun cahaya dari sistem suria kita sendiri.

Planet itu, yang dikenali sebagai Proxima b, mengelilingi zon boleh di-



NASA lancar TESS membantu mengesan exoplanet yang dekat dengan Bumi.

diami' bintang induknya, sekali gus mencadangkan ia berpotensi untuk menghasilkan air, dan mungkin hidupan di permukaannya.

Bagaimanapun, pencarian exoplanets sebenarnya sudah bermula lama sebelum penemuan Proxima b.

Pada 1988, sebuah pasukan penyelidik Kanada mencadangkan wujudnya exoplanet yang kini dikenali sebagai Tadmor.

Pada masa itu, mereka tidak cukup data untuk menerbitkannya, dan akibatnya penemuan itu ditarik balik pada 1992.

Tidak sampai 10 tahun kemudian, kewujudan Tadmor disahkan pada 2002, menurut kenyataan NASA.

Penampilan sulung

Sebaliknya, exoplanet pertama yang membuat penampilan sulung ke dunia ialah 51 Pegasi b, sebuah gergasi gas 'Musytari panas' yang ditemui

pada 1995. Dunia asing yang aneh ini berkedudukan 50 tahun cahaya jauhnya dan mengorbit berhampiran dengan bintang induknya seperti Matahari.

Ketika 51 Pegasi b menjadi dunia asing pertama yang pernah ditemui berhampiran bintang seperti matahari, saintis sebenarnya sudah mengesan tiga 'planet pulsar' lebih awal lagi. Planet-planet ini ditemui pada 1992 di sekitar pusingan 'stellar corpse' yang dipanggil pulsar, terletak kira-kira 2,300 tahun cahaya jauhnya.

Hari ini, dibantu teknologi canggih, kadar untuk menemui exoplanet baharu yang lebih menarik lagi terus meningkat.

Masih terlalu banyak yang perlu dijelajahi dalam pencarian ini. Galaksi bima sakti kita sendiri berkemungkinan terdiri daripada kira-kira 400 bilion bintang, matahari antaranya. Sekiranya setiap bintang itu mempu-

Pencarian planet

→ NASA melancarkan kapal angkasa bersaiz mesin basuh bernilai AS\$337 juta (RM1.31 bilion), meluaskan pencarian planet di luar sistem suria yang mungkin menampung hidupan.

→ **Satelit Peninjau Transit Exoplanet** atau TESS, dilancarkan dengan roket Falcon 9 SpaceX dari Cape Canaveral, Florida.

→ Matlamat utamanya sepanjang dua tahun akan datang ialah **mengimbas lebih 200,000 bintang** paling terang bagi kewujudan planet yang mengelilinginya dan berkelip secara terang dikenali sebagai transit.

→ NASA meramalkan TESS akan menemui 20,000 exoplanet atau planet di luar sistem suria, termasuk lebih 50 bersaiz Bumi dan sehingga 500 lain kurang dua kali ganda saiz Bumi.

→ TESS direka susulan misi kapal angkasa lepas Kepler, kali pertama jenisnya dilancarkan pada 2009. Kapal angkasa berusia itu kini kehabisan bahan api dan bakal tamat operasi.

→ **Kepler menemui** kumpulan besar exoplanet dengan memfokuskan satu bahagian langit yang mengandungi kira-kira 150,000 bintang seperti Matahari.

→ Misi Kepler menemui **2,300 exoplanet** yang disahkan dan ribuan lagi potensi planet namun kebanyakannya terlalu jauh dan malap untuk dikaji lebih lanjut.



Pelancaran Falcon 9 SpaceX.

nyai bukan hanya satu planet tetapi satu sistem yang menyeluruh sama seperti kita, ini bermakna jumlah planet di galaksi itu benar-benar astronomikal. Menurut satu kenyataan dari NASA, jumlah yang dicatat hampir mencecah trilion.

Misi masa depan seperti TESS, akan memperluaskan pencarian exoplanets yang mengorbit beberapa bintang yang paling hampir dan terang di langit Bumi.

TESS akan memantau sekurang-kurangnya 200,000 bintang untuk mencari petunjuk exoplanet, dari dunia berbatu-batu bersaiz Bumi hinggalah kepada planet gergasi gas yang besar.

Data yang dikumpulkan sepanjang misi ini akan digunakan untuk mengenal pasti sasaran yang memerlukan kajian lanjut oleh James Webb Space Telescope, yang dijadual dilancarkan pada 2020.



ZAKRI ABDUL
HAMID

FOSTERING LINKS

SCIENCE AND COMMONWEALTH

The grouping offers an excellent platform to further grow international collaboration and networking in science

THE first-ever meeting of Commonwealth Science Advisers and Equivalents took place in London last week, a side event to this year's Commonwealth Heads of Government summit.

Representatives from 22 of the 53 Commonwealth nations – from Australia to Vanuatu – convened “to share experiences of bringing science into the world of policy to help address global challenges.”

Established in 1931, the Commonwealth of former British colonies and protectorates spans every region, religion and culture – a vast, diverse community of almost 2.5 billion people with an interesting demographic profile: 60 per cent are under 30 years old.

As noted by our host institution, the Royal Society (a fellowship of eminent scientists and the oldest scientific academy in continuous existence), a significant part of the global scientific community is found within Commonwealth nations. Some 12 per cent of the world's researchers reside in member nations, in which around 10 per cent of global investments in research and development take place.

The inaugural meeting was co-chaired by Dr Patrick Vallance, the new UK government chief scientific adviser, and Sir Peter Gluckman, chief science adviser to the prime minister of New Zealand – the latter, a relentless champion of efforts to promote science in government policy-making.

Over the past six years, Sir Peter has also spearheaded the creation of the Asia Pacific Economic Cooperation's Chief Science Advisers and Equivalents, the International Network of Government Science Advice, and the



Britain's Queen Elizabeth speaks at CHOGM. REUTERS PIC

Foreign Ministries Science and Technology Advisors Network.

The goals of these organisations go beyond simply fostering links among those providing science advice to policymakers. The two-day meeting covered the substance of profound challenges we commonly face – climate change, energy security, food security, epidemics and more – and opportunities for science to better address them.

As Sir Peter sees it, the Commonwealth nations face the same development problems as the rest of the world but we have some shared characteristics: language, common law, and similar parliamentary systems and institutions.

His Royal Highness Prince Andrew, the Duke of York, and himself a strong patron of science, stressed the increasing importance of science advice to governments and lamented the lack of scientists within the policy-making world.

He lent his full support, therefore, to this new initiative.

“This wonderful organisation called the Commonwealth, I believe, is under-exploited globally, and I think we ourselves sometimes don't exploit it as much as we could in terms of opportunity that science can provide,” he said.

Themes of the two-day meeting of science advisers mirrored those of the Commonwealth Heads of Governments, which met from April 16 to 20, and included the universally-agreed Sustainable Development Goals (SDGs).

While achieving the SDGs must involve the private sector, civil society and academia, the primary role of governments in establishing relevant and effective policies is clear and requires both new and more systematic use of evidence.

This demands processes to mutually identify and address knowledge gaps related to climate change, the oceans and global health, for example.

Similarly, there are great opportunities for mutual support within the Commonwealth in the use of science for emergency management and enhancing resilience to disasters – greater information sharing, joint development of guidelines and training exercises.

Among many questions discussed:

WHAT challenges are most manageable with better science (research, capacity building, building research networks, evidence synthesis)?

WHAT joint or collective research and linked evidence to

policy activities would best advance sustainability?

WHAT are the respective roles of science advisers and equivalents, academics, research providers and ministries in driving the agenda forward?

Sadly today, structures for linking evidence to policy are weak in many of the countries represented, yet some of the Commonwealth countries lead global thinking in this area.

When the meeting concluded, we established a working party to build this fledgling network, specifically by:

CREATING an information exchange to assist the identification solutions to the SDGs particularly those components related to Commonwealth countries that science and technology can assess;

USING the network to enhance cooperation on risk management and emergency responses;

SHARING approaches to data governance, data ethics and technological assessment;

DEVELOPING a strategy for integrating locally derived data across the Commonwealth to address significant challenges such as sea level rise, food security and freshwater quality;

FACILITATING access to large-scale science infrastructure; and, **DEVELOPING** capacity building for science advice

With globalisation driving challenges to and connections between nations, science has no geographic, political or cultural boundaries. The scope of challenges demands large scale science infrastructure and cooperation, and advanced countries need to assist and strengthen the scientific abilities of developing countries.

The Commonwealth offers an excellent platform to further grow international collaboration and networking in science, as well as the positioning of science at the centre of policy-making, both of which need encouragement in every possible way.

Malaysia stands ready and willing to play its role in this noble enterprise.

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The writer is science adviser to the prime minister and an advocate of science diplomacy

6 The Commonwealth offers an excellent platform to further grow international collaboration and networking in science, as well as the positioning of science at the centre of policy making, both of which need encouragement in every possible way.

Intercepting ransomware attacks

Security provider Sophos uses artificial intelligence and machine learning to counter ransomware, writes Nur Zarina Othman

RANSOMWARE, a type of malicious software that threatens to publish the victim's data or perpetually block access to it unless a ransom is paid, has been creating problems in many companies as well as individuals.

Last year, attacks from ransomwares such as Wannacry, Notpetya and BadRabbit took a lot of companies and individuals by surprise.

Most attacks targeted computers running the Microsoft Windows operating system by encrypting data and demanding ransom payments in Bitcoin cryptocurrency.

For instance, a malware called Notpetya because it masqueraded as the Petya ransomware attacked businesses' corporate network with destructive program worms, trashing the infected machines' file systems.

It demanded US\$300 (RM1,165) in Bitcoin to unscramble the hostage data, the mechanisms put in place to collect this money from victims in exchange for decryption keys.

Meanwhile, Bad Rabbit ransomware infected a few Russian media outlets but only demanded 0.05 bitcoin as ransom.

DARK WEB

Sumit Bansal, Sophos' managing director for Asean and Korea, explains ransomware: "Say you drove your car to the mall, and you parked it at the mall parking lot, but when you came back, you found a lockwheel on your car — it has been clamped, and you can't move your car. You can see your car but you can't use it, and you will need to pay money to get it unlocked. The same applies to your data, you can see it, but the hackers have taken control of it, lock it up and encrypt it".

That's the basic premise of what ransomware does.

But who are the people behind ransomware attacks?

Bansal says they are not necessarily computer hackers or people who write the ransomware program — not those who have technology knowledge.

"Being a technology specialist or an expert is not a quality that is needed for one to acquire the ransomware and in this digital era, as these ransoms are available on the dark web, these malicious programs can be purchased and they are also customisable," he says.

Ransomware has become an easy way to get money quick. What makes it lucrative and difficult to combat is that many countries don't have good law and regulations when it comes to cyber attacks, making it easy for attackers to get away with their crimes.



Bansal says a lot of products in the market have known or unknown vulnerabilities or loose ends that hackers can use.

Bansal says that cases or losses from ransomware attacks are hardly heard of or reported because people pay ransom. They want to get their stolen information back fast and big corporations keep the cases under the carpet because they have reputations to uphold.

For example, Uber took two years to admit that it paid ransom because it was worried about its reputation.

LOOPHOLE

Personal computers, Windows, Apple and even tablets and smartphones have a built-in end point protection — pattern matching or signatures.

But the challenge is that it is humanly impossible to check the variants when you receive 400,000 new patches or patterns signatures variants daily.

Bansal says hackers work in two phases. First, they hack the system and then they deliver the actual ransomware, and this is known as exploits.

"Most organisations think traditional anti-virus run detection is enough, but this is wrong."

A lot of products in the market have known or unknown vulnerabilities or loose ends that hackers can use.

"Traditionally, once vulnerability is detected it will take three to six months to patch the problem and that creates a window of opportunity for someone to take advantage of."

DEEP LEARNING

Sophos lab has identified 24 known techniques or exploits that hackers use to deliver ransom or malware. They use combinations of these types of exploits to hack into a device.

Today, the company uses deep learning — a type of learning done by a company called Invincea which won

a data award in the US for the best machine learning for security.

Deep learning is a branch of machine learning that works by mimicking the human brain. Called an artificial neural network, and just like a human brain you can feed attributes automatically, and it will self-learn on its own.

Sophos then took the deep learning technology and incorporated it into its Intercept X product.

SOLUTION

The advantage of deep learning is its predictive capability to predict unknown threats that try to compromise computers.

Intercept X, meanwhile, recognises the techniques criminals use and stops them before the malware can get to the computers.

Even if it gets through to the device, the Intercept X has a component called Cyptoguard which looks into behaviour which looks like encryption.

It monitors the first three files that are being encrypted and saves them in memory. By the fourth file, it will be able to detect if the encryption is legitimate or not based on its type or pattern.

If the encryption is not legitimate, it will stop further encryption and restore the first three files.

Next, a component called Sophos Clean cleans any remnants of that ransomware and gives a report.

Sophos has incorporated AI into security products like network security in sandboxing technology.

With the many components — predictive, exploit prevention, cryptoguard and root cause analysis — built into one protection engine — Intercept X becomes one of the most powerful end-point protections in the marketplace to date.