The Lord is like a strong tower, where the righteous can go and be safe.
Proverbs 18:10

DIYARYO KABITENYO
Nagmamalasakit sa lalawigan

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Be alert, stand firm in the faith, be brave, be strong.
1 Corinthians 16:13

Imus achieves herd immunity; opens vaccination sites to non-residents

IMUS CITY, Cavite – Mayor Emmanuel Maliksi announced that the city has reached herd immunity, with 85 percent of its target population already fully-vaccinated against the coronavirus disease (COVID-19) as of Jan. 11.

A total of 288,348 people have been given their second dose while 294,763 have received their first dose. The local vaccination team has also administered 44,605 booster shots.

In a Facebook post,

Turn to page 2

Cavite province sets mobility curbs on unvaccinated persons

The provincial board of Cavite released last Jan. 14 details of an ordinance imposing mobility restrictions on persons unvaccinated for COVID-19.

The board passed Provincial Ordinance No. 341-2022 last Jan. 10, banning unvaccinated individuals from public transportation unless they need access to essential goods or services.

The ordinance also orders unvaccinated individuals to take a reverse transcription-polymerase chain reaction (RT-PCR) test every two weeks at their own expense. They also need to present a negative COVID-19 test result before being admitted

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Remembering faces and names can be improved during sleep

For those who rarely forget a face, but struggle with names, the remedy for boosting learning may as near as your pillow.

New research by Northwestern University is the first to document the effect reactivating memory during sleep has on face-name learning.

The researchers found that people's name recall improved significantly when memories of newly learned face-name associations were reactivated while they were napping. Key to this improvement was uninterrupted deep sleep.

"It's a new and exciting finding about sleep, because it tells us that the way information is reactivated during sleep to improve memory storage is linked with high-quality sleep," said lead author Nathan Whitmore, a Ph.D. candidate in the Interdepartmental Neuroscience Program at Northwestern.

The paper, "Targeted memory reactivation of face-name learning depends on ample and undisturbed slow-wave sleep," will publish Jan. 12 in the Nature partner journal NPJ: Science of Learning.

The paper's senior author is Ken Paller, professor of psychology and director of the Cognitive Neuroscience Program at Weinberg College of Arts and Sciences at Northwestern. The paper was also co-authored by Adrianna Bassard, Ph.D. candidate in psychology at Northwestern.

The research team found that for study participants with EEG measures (a recording of electrical activity of the brain picked up by electrodes on the scalp) that indicated disrupted sleep, the memory reactivation didn't help and may even be detrimental. But in those with uninterrupted sleep during the specific times of sound presentations, the reactivation led to a relative improvement averaging just over 1.5 more names recalled.

The study was conducted on 24 participants, aged 18-31 years old, who were asked to memorize the faces and names of 40 pupils from a hypothetical Latin American history class and another 40 from a Japanese history class. When each face was shown again, they were asked to produce the name that went with it. After the learning exercise, participants took a nap while the researchers carefully monitored brain activity using EEG measurements. When participants reached the N3 "deep sleep" state, some of the names were softly played on a speaker with music that was associated with one of the classes.

(IMUS... from page 1)

Maliksi thanked the city's vaccination team for their diligence and hard work.

Now that the city has achieved herd immunity, the local government unit (LGU) will officially open its vaccination sites to residents of nearby cities and municipalities.

(CAVITE... from page 1)

for onsite work.

The order covers non-Cavite residents who are working and traveling to the province.

It also bans unvaccinated individuals from outdoor dining in food establishments and leisure trips to malls, hotels, events places, sports clubs, and similar venues.

The order, however, allows them to do outdoor physical exercises within their general area of residences like their barangay, subdivision, or village.

All provincial board members approved the ordinance sponsored by Board Member Kerby Salazar.

The restrictions will be lifted when the province is downgraded to Alert Level 2. The province was placed under Alert Level 3 from Jan. 5 to 31.

Cavite also passed Provincial Ordinance No. 342-2022 sponsored by Board Member Reyniel Ambion, setting a 10 pm to 4 am curfew.

Republic of the Philippines
REGIONAL TRIAL COURT
Fourth Judicial Region
Branch 109
Carmona, Cavite

HOME DEVELOPMENT MUTUAL FUND
Mortgagee,

EJF-2021-32
For: Extra-Judicial Foreclosure of Real Estate Mortgage Under Act No. 3135, as amended by Act. No. 4118

-versus-

MARIO F. BONGANAY married to HELEN GRACE M. BONGANAY,
Mortgagor

x----------x

NOTICE OF SHERIFF'S SALE

Upon Extra-Judicial petition for sale under Act No. 3135, as amended by Act 4118 filed by the mortgagee, **HOME DEVELOPMENT MUTUAL FUND**, with postal address at 12th Floor JELP Business Solution Center No. 409 Shaw Boulevard, Mandaluyong City against the mortgagor, **MARIO F. BONGANAY married to HELEN GRACE M. BONGANAY**, with postal address at 3835 ME Carmona, Cupang, Muntinlupa, Metro Manila, and for the satisfaction of the mortgaged debt which as of **November 5, 2021** amounts to **TWO HUNDRED TWENTY NINE THOUSAND THREE HUNDRED NINETY ONE PESOS & 8/100 (PHP229,391.88)**, exclusive of all legal fees and expenses incidental to this foreclosure and sale, the undersigned or his duly authorized representative will SELL at public auction on **February 17, 2022** at 1:30 o' clock in the afternoon at the Court Room of Branch 109, Regional Trial Court, Hall of Justice Building, Carmona, Cavite to the highest bidder for CASH or MANAGER'S CHECK, in Philippine currency, the mortgaged property/ies with all the improvements thereon as we

TRANSFER CERTIFICATE OF TITLE NO. 057-2013044043

IT IS HEREBY CERTIFIED that certain land situated in BRGY. OF CABILANG BAYBAY (POBLACION 5; NOW), MUN. OF CARMONA (GEN. MARIANO ALVAREZ NOW), PROV. OF CAVITE, bounded and described as follows:

"A PARCEL OF LAND (LOT 7, BLK. 4-C OF THE CONS. AND SUBD. PLAN, PCS-04-020461, BEING A PORTION OF THE CONS. OF LOTS 3, 5, 7, 9, 11, 13, 15, 17, 21 & 23, BLK. 2, LOTS 7 TO 33, BLK. 4, LOTS 1 TO 21 BLK. 5, LOTS 1 TO 15 BLK. 6, LOTS 1 TO 51, BLK. 25 & BLK. 26, ALL OF PSD-04-001080, L.R.C. REC. NO. 41926; SITUATED IN THE BRGY. OF CABILANG BAYBAY (POBLACION 5, NOW), MUN. OF CARMONA (GEN. MARIANO ALVAREZ NOW), PROV. OF CAVITE. BOUNDED ON THE NW., ALONG LINE 1-2 BY LOT 9, BLK. 4-C; ON THE NE., ALONG LINE 2-3 BY RD. LOT 21; ON THE SE., ALONG LINE 3-4 BY LOT 5; ON THE SW., ALONG LINE 4-5 BY LOT 6, ALONG LINE 5-1 BY LOT 8, ALL OF BLK. 4-C, ALL OF THE CONS. & SUBD. PLAN. BEGINNING AT A PT. MARKED "1" ON PLAN, BEING S. 72 DEG. 47'W., 4682.32 M. FROM BLBM NO. 2, CABILANG BAYBAY, CARMONA, CAVITE. THENCE N. 80 DEG. 12'E., 9.00 M. TO PT. 2; THENCE S. 09 DEG. 48'E., 4.44 M. TO PT. 3; THENCE S. 80 DEG. 12'W., 9.00 M. TO PT. 4; THENCE N. 09 DEG. 48'W., 1.42 M. TO PT. 5; THENCE N. 09 DEG. 48'W., 3.02 M. TO THE PT. OF BEGINNING, CONTAINING AN AREA OF FORTY (40) SQUARE METERS. ALL PTS. REFERRED TO ARE INDICATED ON THE PLAN AND ARE MARKED ON THE GROUND BY P.S. CYL. CONC. MONS. 15 X 60 CM. BEARINGS TRUE; DATE OF ORIG. SURVEY: MAY 26-28, 1924 AND THAT OF THE CONS. & SUBD. SURVEY: AUG. 2-30, 2004 AND WAS APPROVED ON NOV. 10, 2004."

xxxNOTHING FOLLOWSxxx

Prospective buyers and/or bidders are hereby enjoined to investigate for themselves the title of the said property and the encumbrances thereon, if there be any.

All posted bids must be subscribed to the undersigned on the above-stated time and date.

In the event the public auction should not take place on the said date and time, it shall be held on **February 24, 2022**, at the same time and place without further notice.

Carmona, Cavite, **January 4, 2022**.

(Sgd.) **BON GERARD D. ASCAÑO**
Clerk of Court VI
& Ex-Officio Sheriff

Prepared by:

(Sgd.) **JOSEPH B. DIOKNO**
Sheriff In-Charge

Copy Furnished:

HOME DEVELOPMENT MUTUAL FUND
12th Floor JELP Business Solution Center
No. 409 Shaw Boulevard, Mandaluyong City

ATTY. SIMEON P. MADRID
S.P. MADRID & ASSOCIATES
Unit 2010 26/F Herrera Tower
V.A. Rufino cor. Valero Sts., Makati City

MARIO F. BONGANAY
c/o to HELEN GRACE M. BONGANAY

1. 3835 ME Carmona, Cupang
Muntinlupa City

2. Lot 7 Blk. 4-C, GMA Village
Brgy. Cabilang Baybay (now Poblacion 5)
Carmona (now GMA), Cavite

Publication : DIYARYO KABITENYO
Dates : January 10, 17 & 24, 2022

Newly discovered type of 'strange metal' could lead to deep insights

Scientists understand quite well how temperature affects electrical conductance in most everyday metals like copper or silver. But in recent years, researchers have turned their attention to a class of materials that do not seem to follow the traditional electrical rules. Understanding these so-called "strange metals" could provide fundamental insights into the quantum world, and potentially help scientists understand strange phenomena like high-temperature superconductivity.

Now, a research team co-led by a Brown University physicist has added a new discovery to the strange metal mix. In research published in the journal Nature, the team found strange metal behavior in a material in which electrical charge is carried not by electrons, but by more "wave-like" entities called Cooper pairs.

REPUBLIC OF THE PHILIPPINES
Local Civil Registry Office
Municipality of Tanza
Province of Cavite

NOTICE OF PUBLICATION

In compliance with Sec. 5 of Rep. Act No. 9048, a notice is hereby served to the public that **PEDRITO P. CUNANAN** has filed with this office a petition for **CHANGE OF FIRST NAME** (OCRG & LCRO Copy) from **CESAR** to **PEDRITO** in the **CERTIFICATE OF LIVE BIRTH** of one CESAR PLATON CUNANAN, who was born on **December 9, 1967** at **Tanza, Cavite** and parents were **JESUS P. CUNANAN and GENOVEVA A. PLATON**.

Any person adversely affected by said petition may file his written opposition with this Office not later than **January 24, 2022**.

(Sgd.) **MA. THERESA J. CESA**
Municipal Civil Registrar

DIYARYO KABITENYO - January 10 & 17, 2022

EXTRAJUDICIAL SETTLEMENT OF ESTATE OF THE DECEASED SPOUSES REYNALDO M. SAMSON AND LYDIA D. SAMSON AND FELIX M. SAMSON

NOTICE is hereby given that the estate of the deceased **SPOUSES REYNALDO SAMSON SR. and LYDIA DEL ROSARIO** who both died intestate on April 2, 2009 and March 7, 2013, respectively, and **FELIX SAMSON** who died intestate on January 24, 1999, consisting of a parcel of land the deceased Reynaldo M. Samson Sr. married to Lydia del Rosario and Felix M. Samson were the registered co-owners, situated in the Municipality of Dasmariñas, Province of Cavite, Island of Luzon, covered by Transfer Certificate of Title No.T- 81370, containing an area of EIGHTEEN THOUSAND ONE HUNDRED NINETY-TWO (18,192) SQUARE METERS, more or less, has been adjudicated and extrajudicially settled by and among the HEIRS OF REYNALDO M. SAMSON SR. and LYDIA D. SAMSON who became the owner of ½ share of the property by operation of law and HEIRS OF FELIX M. SAMSON who received by operation of law the other half on November 18, 2021 at City of Manila before Notary Public Atty. Jiuly A. Landianibal and entered in her Notarial Register as Doc. No. 456; Page No. 92; Book No. I; Series of 2021.

(Sgd.) **Reynaldo Del Rosario Samson Jr.; Eleanor S. Melo and Edna R. Samson for herself and as Atty-in-fact of Conchita R. Samson, Thelma S. Villanueva, Wennie S. Revestir and Maria Lourdes Antonio-Samson (heir of Donato Samson)**

Publication : DIYARYO KABITENYO
Dates : January 10, 17 & 24, 2022

REPUBLIC OF THE PHILIPPINES
FOURTH JUDICIAL REGION
REGIONAL TRIAL COURT
OFFICE OF THE CLERK OF COURT
TRECE MARTIRES CITY

HOME DEVELOPMENT MUTUAL FUND
Mortgagee,

FORECLOSURE CASE NO. F-600-15

-versus-

ALLAN M. MAÑIBO
married to IMELDA A. MAÑIBO
Mortgagor/s.

x---x

NOTICE OF EXTRA-JUDICIAL SALE

Upon Extra-Judicial Petition for Sale under Act 3135, as amended by Act 4118, filed by Mortgagee, **HOME DEVELOPMENT MUTUAL FUND,** with business address at 12th Floor JELP Business Solution Center, No. 409 Shaw Boulevard, Mandaluyong City, against the Mortgagor/s, **ALLAN M. MAÑIBO married to IMELDA A. MAÑIBO** with residence and postal address at LOT 4 BLOCK 21, WEST GOVERNOR HEIGHTS 2, CABUCO, TRECE MARTIRES CITY, CAVITE to satisfy the mortgage indebtedness which as of **14 August 2015** amounts to **SIX HUNDRED SEVENTY THREE THOUSAND SIX HUNDRED NINETY SIX PESOS and 87/100 (P673,696.87),** Philippine Currency, including interest, penalties and other charges as of said date but exclusive of all the other expenses incidental to this Foreclosure and sale, the undersigned Sheriff will set at public auction on **January 20, 2022** at 10:00 o'clock in the morning at the main entrance of the Government Center Building located at the Provincial Capitol Compound, Trece Martires City, to the highest bidder for CASH and in Philippine Currency, the following described property with all the improvements thereon, to wit:

TRANSFER CERTIFICATE OF TITLE NO. 077-2012000826

A PARCEL OF LAND (LOT 4, BLK 21 OF THE CONS. SUBD. PLAN PCS-04-023167, BEING A PORTION OF LOT 2455-N, 3615 & 3619-B, FLS-1439 STA. CRUZ DE MALABON ESTATE) SITUATED IN BRGY CABUCO, CITY OF TRECE MARTIRES, PROV. OF CAVITE, ISLAND OF LUZON. BOUNDED ON THE NW., ALONG LINE 1-2 BY LOT 6, BLK. 21; ON THE NE., ALONG LINE 2-3 BY ROAD LOT 30; ON THE SE., ALONG LINE 3-4 BY LOT 2, BLK 21 AND ON THE SW., ALONG LINE 4-1 BY LOT 1, BLK 21 ALL OF THE CONS. SUBD. PLAN. BEGINNING AT A PT. MARKED "1" ON PLAN. **XXX CONTAINING AN AREA OF FIFTY (50) SQ. METERS XXX**

All sealed bids must be submitted to the undersigned on the above-stated time and date.

In the event the public auction should not take place on the said date and time, it shall be held on **February 10, 2022** without further notice.

Prospective bidders/buyers are hereby enjoined to investigate for themselves the title to the said property and encumbrances thereon, if any there be.

Trece Martires City, **November 25, 2021.**

(Sgd.) **LUCIO C. ALEJO III**
Sheriff IV

Copy Furnished:

HOME DEVELOPMENT MUTUAL FUND
12th Floor JELP Business Solution Center
No. 409 Shaw Boulevard, Mandaluyong City

ALLAN M. MAÑIBO
married to IMELDA A. MAÑIBO
LOT 4, BLOCK 21, WEST GOVERNOR HEIGHTS 2, CABUCO, TRECE MARTIRES CITY, CAVITE

WARNING: It is absolutely prohibited to remove, deface or destroy this Notice of Extra Judicial Sale on or before the date of sale.

Publication : DIYARYO KABITENYO
Dates : December 6, 13 & 20, 2021

REPUBLIC OF THE PHILIPPINES
FOURTH JUDICIAL REGION
REGIONAL TRIAL COURT
OFFICE OF THE CLERK OF COURT
TRECE MARTIRES CITY

HOME DEVELOPMENT MUTUAL FUND
Mortgagee,

FORECLOSURE CASE NO. F-897-16

-versus-

EDGARDO G. ABUTIN
Mortgagor/s.

x---x

NOTICE OF EXTRA-JUDICIAL SALE

Upon Extra-Judicial Petition for Sale under Act 3135, as amended by Act 4118, filed by Mortgagee, **HOME DEVELOPMENT MUTUAL FUND,** with business address at 12th Floor JELP Business Solution Center, No. 409 Shaw Boulevard, Mandaluyong City, against the Mortgagor/s, **EDGARDO G. ABUTIN,** with residence and postal address at LOT 10, BLOCK 1, VILLE DE PALME SUBDIVISION, SANTIAGO, GENERAL TRIAS, CAVITE to satisfy the mortgage indebtedness which as of **23 June 2016** amounts to **ONE MILLION THREE HUNDRED THIRTY NINE THOUSAND FOUR HUNDRED FIFTY NINE PESOS AND 53/100 (P1,339,459.53),** Philippine Currency, including interest, penalties and other charges as of said date but exclusive of all the other expenses incidental to this foreclosure and sale, the undersigned Sheriff will set at public auction on **January 20, 2022** at 10:00 o'clock in the morning at the main entrance of the Government Center Building located at the Provincial Capitol Compound, Trece Martires City, to the highest bidder for CASH and in Philippine Currency, the following described property with all the improvements thereon, to wit:

TRANSFER CERTIFICATE OF TITLE NO. 057-2011007927

A PARCEL OF LAND (LOT 10 BLK. 1 OF THE CONS. & SUBD. PLAN, PCS-04-020925, BEING A PORTION OF THE CONS. OF LOTS 2565 & 3484, (RS-04- 002981) SAN FRANCISCO DE MALABON ESTATE, L.R.C. REC. NO. 5984) SITUATED IN BRGY. OF SANTIAGO, MUN. OF GEN. TRIAS, PROVINCE OF CAVITE, ISLAND OF LUZON. BOUNDED ON THE SE., ALONG LINE 1-2 BY LOT 9 BLK. 1; ON THE SW., ALONG LINE 2-3 BY LOT 73 BLK. 1; ON THE NW., ALONG LINE 3-4 BY LOT 11 BLK. 1 AND ON THE NE., ALONG LINE 4-1 BY ROAD LOT 1 ALL OF THE CONS. & SUBD. PLAN. BEGINNING AT A PT. MARKED "1"ON PLAN **xxx CONTAINING AN AREA OF FIFTY (50) SQUARE METERS xxx**

All sealed bids must be submitted to the undersigned on the above-stated time and date.

In the event the public auction should not take place on the said date and time, it shall be held on **February 10, 2022** without further notice.

Prospective bidders/buyers are hereby enjoined to investigate for themselves the title to the said property and encumbrances thereon, if any there be.

Trece Martires City, **November 25, 2021.**

(Sgd.) **LUCIO C. ALEJO III**
Sheriff IV

Copy Furnished:

HOME DEVELOPMENT MUTUAL FUND
12th Floor JELP Business Solution Center
No. 409 Shaw Boulevard, Mandaluyong City

EDGARDO G. ABUTIN
LOT 10, BLOCK 1, VILLE DE PALME SUBDIVISION, SANTIAGO, GENERAL TRIAS, CAVITE

WARNING: It is absolutely prohibited to remove, deface or destroy this Notice of Extra Judicial Sale on or before the date of sale.

Publication : DIYARYO KABITENYO
Dates : December 6, 13 & 20, 2021

ERRATUM

As per Notice of Extra-Judicial Foreclosure of Real Estate Mortgage filed by **HOME DEVELOPMENT MUTUAL FUND** in **FORECLOSURE CASE NO. F-600-15** published in the three (3) consecutive issues of **DIYARYO KABITENYO** dated December 6-12, 2021; December 13-19, 2021 and December 20-26, 2021, the name of Mortgagor/s should have erroneously read: **ALLAN M. MAÑIBO married to IMELDA A. MAÑIBO.**

– The Editor

ERRATUM

As per Notice of Extra-Judicial Foreclosure of Real Estate Mortgage filed by **HOME DEVELOPMENT MUTUAL FUND** against **EDGARDO G. ABUTIN** in **FORECLOSURE CASE NO. F- F-897-16** published in the three (3) consecutive issues of **DIYARYO KABITENYO** dated December 6-12, 2021; December 13-19, 2021 and December 20-26, 2021, the technical description of the mortgaged property with all the improvements thereon should have read:

TRANSFER CERTIFICATE OF TITLE NO. 057-2011007927

A PARCEL OF LAND (LOT 10 BLK. 1 OF THE CONS. & SUBD. PLAN, PCS-04-020925, BEING A PORTION OF THE CONS. OF LOTS 2565 & 3484, (RS-04- 002981) SAN FRANCISCO DE MALABON ESTATE, L.R.C. REC. NO. 5984) SITUATED IN BRGY. OF SANTIAGO, MUN. OF GEN. TRIAS, PROVINCE OF CAVITE, ISLAND OF LUZON. BOUNDED ON THE SE., ALONG LINE 1-2 BY LOT 9 BLK. 1; ON THE SW., ALONG LINE 2-3 BY LOT 73 BLK. 1; ON THE NW., ALONG LINE 3-4 BY LOT 11 BLK. 1 AND ON THE NE., ALONG LINE 4-1 BY ROAD LOT 1 ALL OF THE CONS. & SUBD. PLAN. BEGINNING AT A PT. MARKED "1" ON PLAN **xxx CONTAINING AN AREA OF FIFTY (50) SQUARE METERS xxx**

– The Editor

Oxygen ions in Jupiter's innermost radiation belts

Nearly 20 years after the end of NASA's Galileo mission to Jupiter, scientists led by the Max Planck Institute for Solar System Research (MPS) in Germany have unlocked a new secret from the mission's extensive data sets. For the first time, the research team was able to determine beyond doubt that the high-energy ions surrounding the gas giant as part of its inner radiation belt are primarily oxygen and sulfur ions. They are thought to have originated in volcanic eruptions on Jupiter's moon Io.

Near the orbit of the moon Amalthea, which orbits Jupiter further inward, the team discovered an unexpectedly high concentration of high-energy oxygen ions that cannot be explained by Io's volcanic activity.

Successful transplant of porcine heart into adult human with end-stage heart

In a first-of-its-kind surgery, a 57-year-old patient with terminal heart disease received a successful transplant of a genetically-modified pig heart and is still doing well three days later. It was the only currently available option for the patient. The historic surgery was conducted by University of Maryland School of Medicine (UMSOM) faculty at the University of Maryland Medical Center (UMMC), together known as the University of Maryland Medicine.

This organ transplant demonstrated for the first time that a genetically-modified animal heart can function like a human heart without immediate rejection by the body. The patient, David Bennett, a Maryland resident, is being carefully monitored over the next days and weeks to determine whether the transplant provides life-saving benefits. He had been deemed ineligible for a conventional heart transplant at UMMC as well as at several other leading transplant centers that reviewed his medical records.

"It was either die or do this transplant. I want to live. I know it's a shot in the dark, but it's my last choice," said Mr. Bennett, the patient, a day before the surgery was conducted. He had been hospitalized and bedridden for the past few months. "I look forward to getting out of bed after I recover."

The U.S. Food and Drug Administration granted emergency authorization for the surgery on New Year's Eve through its expanded access (compassionate use) provision. It is used when an experimental medical product, in this case the genetically-modified pig's heart, is the only option available for a patient faced with a serious or life-threatening medical condition. The authorization to proceed was granted in the hope of saving the patient's life.

"This was a breakthrough surgery and brings us one step closer to solving the organ shortage crisis. There are simply not enough donor human hearts available to meet the long list of potential recipients," said Bartley P. Griffith, MD, who surgically transplanted the pig heart into the patient. Dr. Griffith is the Thomas E. and Alice Marie Hales Distinguished Professor in Transplant Surgery at UMSOM. "We are proceeding cautiously, but we are also optimistic that this first-in-the-world surgery will provide an important new option for patients in the future."

Considered one of the world's foremost experts on transplanting animal organs, known as xenotransplantation, Muhammad M. Mohiuddin, MD, Professor of Surgery at UMSOM, joined the UMSOM faculty five years ago and established the Cardiac Xenotransplantation Program with Dr. Griffith. Dr. Mohiuddin serves as the program's Scientific/Program Director and Dr. Griffith as its Clinical Director.

"This is the culmination of years of highly complicated research to hone this technique in animals with survival times that have reached beyond nine months. The FDA used our data and data on the experimental pig to authorize the transplant in an end-stage heart disease patient who had no other treatment options," said Dr. Mohiuddin. "The successful procedure provided valuable information to help the medical community improve this potentially life-saving method in future patients."

About 110,000 Americans are currently waiting for an organ transplant, and more than 6,000 patients die each year before getting one, according to the federal government's organdonor.gov. Xenotransplantation could potentially save thousands of lives but does carry a unique set of risks, including the possibility of triggering a dangerous immune response. These responses can trigger an immediate rejection of the organ with a potentially deadly outcome to the patient.

Xenotransplants were first tried in the 1980s, but were largely abandoned after the famous case of Stephanie Fae Beauclair (known as Baby Fae) at Loma Linda University in California. The infant, born with a fatal heart condition, received a baboon heart transplant and died within a month of the procedure due to the immune system's rejection of the foreign heart. However, for many years, pig heart valves have been used successfully for replacing valves in humans.

Cosmic 'spider' found to be source of powerful gamma-rays

Using the 4.1-meter SOAR Telescope in Chile, astronomers have discovered the first example of a binary system where a star in the process of becoming a white dwarf is orbiting a neutron star that has just finished turning into a rapidly spinning pulsar. The pair, originally detected by the Fermi Gamma-ray Space Telescope, is a "missing link" in the evolution of such binary systems.

A bright, mysterious source of gamma rays has been found to be a rapidly spinning neutron star — dubbed a millisecond pulsar — that is orbiting a star in the process of evolving into an extremely-low-mass white dwarf. These types of binary systems are referred to by astronomers as "spiders" because the pulsar tends to "eat" the outer parts of the companion star as it turns into a white dwarf.

The duo was detected by astronomers using the 4.1-meter SOAR Telescope on Cerro Pachón in Chile, part of Cerro Tololo Inter-American Observatory (CTIO), a Program of NSF's NOIRLab.

NASA's Fermi Gamma-ray Space Telescope has been cataloging objects in the Universe that produce copious gamma rays since its launch in 2008, but not all of the sources of gamma rays that it detects have been classified. One such source, called 4FGL J1120.0-2204 by astronomers, was the second brightest gamma-ray source in the entire sky that had gone unidentified, until now.

Astronomers from the United States and Canada, led by Samuel Swihart of the US Naval Research Laboratory in Washington, D.C., used the Goodman Spectrograph on the SOAR Telescope to determine the true identity of 4FGL J1120.0-2204. The gamma-ray source, which also emits X-rays, as observed by NASA's Swift and ESA's XMM-Newton space telescopes, has been shown to be a binary system consisting of a "millisecond pulsar" that spins hundreds of times per second, and the precursor to an extremely-low-mass white dwarf. The pair are located over 2600 light-years away.

"Michigan State University's dedicated time on the SOAR Telescope, its location in the southern hemisphere and the precision and stability of the Goodman spectrograph, were all important aspects of this discovery," says Swihart.

"This is a great example of how mid-sized telescopes in general, and SOAR in particular, can be used to help characterize unusual discoveries made with other ground and space-based facilities," notes Chris Davis, NOIRLab Program Director at US National Science Foundation. "We anticipate that SOAR will play a crucial role in the follow-up of many other time-variable and multi-messenger sources over the coming decade."

The optical spectrum of the binary system measured by the Goodman spectrograph showed that light from the proto-white dwarf companion is Doppler shifted — alternately shifted to the red and the blue — indicating that it orbits a compact, massive neutron star every 15 hours.

"The spectra also allowed us to constrain the approximate temperature and surface gravity of the companion star," says Swihart, whose team was able to take these properties and apply them to models describing how binary star systems evolve. This allowed them to determine that the companion is the precursor to an extremely-low-mass white dwarf, with a surface temperature of 8200 °C (15,000 °F), and a mass of just 17% that of the Sun.

When a star with a mass similar to that of the Sun or less reaches the end of its life, it will run out of the hydrogen used to fuel the nuclear fusion processes in its core. For a time, helium takes over and powers the star, causing it to contract and heat up, and prompting its expansion and evolution into a red giant that is hundreds of millions of kilometers in size. Eventually, the outer layers of this swollen star can be accreted onto a binary companion and nuclear fusion halts, leaving behind a white dwarf about the size of Earth and sizzling at temperatures exceeding 100,000 °C (180,000 °F).

The proto-white dwarf in the 4FGL J1120.0-2204 system hasn't finished evolving yet. "Currently it's bloated, and is about five times larger in radius than normal white dwarfs with similar masses," says Swihart. "It will continue cooling and contracting and, in about two billion years, it will look identical to many of the extremely low mass white dwarfs that we already know about."

Millisecond pulsars twirl hundreds of times every second.

Study challenges evolutionary theory that DNA mutations are random

A simple roadside weed may hold the key to understanding and predicting DNA mutation, according to new research from University of California, Davis, and the Max Planck Institute for Developmental Biology in Germany.

The findings, published January 12 in the journal Nature, radically change our understanding of evolution and could one day help researchers breed better crops or even help humans fight cancer.

Mutations occur when DNA is damaged and left unrepaired, creating a new variation. The scientists wanted to know if mutation was purely random or something deeper. What they found was unexpected.

"We always thought of mutation as basically random across the genome," said Grey Monroe, an assistant professor in the UC Davis Department of Plant Sciences who is lead author on the paper. "It turns out that mutation is very non-random and it's non-random in a way that benefits the plant. It's a totally new way of thinking about mutation."

Researchers spent three years sequencing the DNA of hundreds of Arabidopsis thaliana, or thale cress, a small, flowering weed considered the "lab rat among plants" because of its relatively small genome comprising around 120 million base pairs. Humans, by comparison, have roughly 3 billion base pairs.

"It's a model organism for genetics," Monroe said.

Work began at Max Planck Institute where researchers grew specimens in a protected lab environment, which allowed plants with defects that may not have survived in nature be able to survive in a controlled space.

Sequencing of those hundreds of Arabidopsis thaliana plants revealed more than 1 million mutations. Within those mutations a nonrandom pattern was revealed, counter to what was expected.

"At first glance, what we found seemed to contradict established theory that initial mutations are entirely random and that only natural selection determines which mutations are observed in organisms," said Detlef Weigel, scientific director at Max Planck Institute and senior author on the study.

Instead of randomness they found patches of the genome with low mutation rates. In those patches, they were surprised to discover an over-representation of essential genes, such as those involved in cell growth and gene expression.

"These are the really important regions of the genome," Monroe said. "The areas that are the most biologically important are the ones being protected from mutation."

The areas are also sensitive to the harmful effects of new mutations. "DNA damage repair seems therefore to be particularly effective in these regions," Weigel added.

The scientists found that the way DNA was wrapped around different types of proteins was a good predictor of whether a gene would mutate or not. "It means we can predict which genes are more likely to mutate than others and it gives us a good idea of what's going on," Weigel said.

The findings add a surprising twist to Charles Darwin's theory of evolution by natural selection because it reveals that the plant has evolved to protect its genes from mutation to ensure survival.

"The plant has evolved a way to protect its most important places from mutation," Weigel said. "This is exciting because we could even use these discoveries to think about how to protect human genes from mutation."

Knowing why some regions of the genome mutate more than others could help breeders who rely on genetic variation to develop better crops. Scientists could also use the information to better predict or develop new treatments for diseases like cancer that are caused by mutation.

"Our discoveries yield a more complete account of the forces driving patterns of natural variation; they should inspire new avenues of theoretical and practical research on the role of mutation in evolution," the paper concludes.

Co-authors from UC Davis include Daniel Kliebenstein, Mariele Lensink, Marie Klein, from the Department of Plant Sciences.

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Assessing Progression Risk in Cancer

A molecular feature in prostate cancer, called endogenous retroviral (ERV) RNA, has been found to have prognostic value and also distinguish differences between men of African and European or Middle Eastern ancestry, according to a study led by researchers at the University of California, Irvine. The team also identified ERV expression signatures that may be useful for identifying prostate cancer patients at greatest risk of progression regardless of ancestry, which may also extend to progression in other cancers.

Findings from the study, "Expression of Endogenous Retroviral RNA in Prostate Tumors has Prognostic Value and Shows Differences among Americans of African Versus European/Middle Eastern Ancestry," were recently published in the online journal Cancers.

Prostate cancer is the most common cancer diagnosed in men in the U.S. and affects millions of men worldwide, but there are disparities in its aggressiveness between different ancestries. There is a higher burden among Black American men compared to White American men. Black American patients are diagnosed at an earlier age and at a more advanced stage than White American patients and being Black is an independent predictor of disease relapse in those undergoing radical prostatectomy.

"Measuring ERV expression may have the potential to help physicians predict which patients would most benefit from active surveillance or radical therapy, and they also have the potential to be useful in clinically relevant prognostic models for other cancers," said Farahnaz Rahmatpanah, PhD, assistant professor in residency in the Department of Pathology & Laboratory Medicine at the UCI School of Medicine.

Earliest human remains in eastern Africa dated to more than 230,000 years ago

The age of the oldest fossils in eastern Africa widely recognised as representing our species, Homo sapiens, has long been uncertain. Now, dating of a massive volcanic eruption in Ethiopia reveals they are much older than previously thought.

The remains -- known as Omo I -- were found in Ethiopia in the late 1960s, and scientists have been attempting to date them precisely ever since, by using the chemical fingerprints of volcanic ash layers found above and below the sediments in which the fossils were found.

An international team of scientists, led by the University of Cambridge, has reassessed the age of the Omo I remains -- and Homo sapiens as a species. Earlier attempts to date the fossils suggested they were less than 200,000 years old, but the new research shows they must be older than a colossal volcanic eruption that took place 230,000 years ago. The results are reported in the journal Nature.

The Omo I remains were found in the Omo Kibish Formation in southwestern Ethiopia, within the East African Rift valley. The region is an area of high volcanic activity, and a rich source of early human remains and artefacts such as stone tools. By dating the layers of volcanic ash above and below where archaeological and fossil materials are found, scientists identified Omo I as the earliest evidence of our species, Homo sapiens.

"Using these methods, the generally accepted age of the Omo fossils is under 200,000 years, but there's been a lot of uncertainty around this date," said Dr Céline Vidal from Cambridge's Department of Geography, the paper's lead author. "The fossils were found in a sequence, below a thick layer of volcanic ash that nobody had managed to date with radiometric techniques because the ash is too fine-grained."

As part of a four-year project led by Professor Clive Oppenheimer, Vidal and her colleagues have been attempting to date all the major volcanic eruptions in the Ethiopian Rift around the time of the emergence of Homo sapiens, a period known as the late Middle Pleistocene.

The researchers collected pumice rock samples from the volcanic deposits and ground them down to sub-millimetre size. "Each eruption has its own fingerprint -- its own evolutionary story below the surface, which is determined by the pathway the magma followed," said Vidal. "Once you've crushed the rock, you free the minerals within, and then you can date them, and identify the chemical signature of the volcanic glass that holds the minerals together."