

LAMPIRAN 1
UTUSAN MALAYSIA (MEGA SAINS) : MUKA SURAT 15
TARIKH : 21 MEI 2018 (ISNIN)

BUNGA HIASAN TEKNOLOGI NUKLEAR

INDUSTRI tanaman di negara ini terutama bunga hiasan (*ornamental*) masih kekurangan varieti (jenis) yang berkualiti. Masalah tersebut dilihat akan membantutkan perkembangan industri tanaman yang bernilai komersial khususnya bunga hiasan.

Mekanisme terbaik bagi mencari jalan penyelesaian

Oleh LAUPA JUNUS
laupajunus@hotmail.com



masalah tersebut adalah menerusi penyelidikan berterusan. Ini kerana dengan adanya usaha penyelidikan dan pembangunan (R&D) dalam pelbagai bidang terbukti ia bukan sahaja membantu perkembangan industri, bahkan dalam masa yang sama, dapat membantu pengusaha terutama di luar bandar.

Antara kejayaan yang boleh diketengahkan adalah menerusi penggunaan teknologi nuklear menghasilkan pelbagai varieti tanaman industri dan hiasan.

Kejayaan Kementerian Sains, Teknologi dan Inovasi (MOSTI) menerusi Agensi Nuklear Malaysia menghasilkan tanaman mutan menggunakan teknologi sinaran jelas memberi manfaat kepada masyarakat. Teknologi aruhan mutasi (biak baka mutasi) menggunakan teknologi nuklear (sinaran mengion) diperkenalkan sejak 1990-an lagi dengan

mendedahkan biji benih tanaman kepada sinaran tersebut pada dos dan tempoh tertentu dan akhirnya menghasilkan varieti yang lebih baik.

Menurut Pengurus Kumpulan Pembaikbakaan Tanaman Bahagian Agroteknologi dan Biosains agensi berkenaan, **Dr. Zaiton Ahmad**, tujuan penyelidikan tersebut adalah untuk membantu industri tanaman hiasan supaya mempunyai anak benih berkualiti.

"Kami banyak menerima aduan dari nurseri bahawa mereka kekurangan benih dan terlalu bergantung kepada varieti import," ujarnya ketika ditemui pada majlis penyerahan projek Inovasi Sosial MOSTI (MSI) Agensi Nuklear Malaysia dan Program Mesta Komuniti di Pekan Nabalu Tuaran, Sabah baru-baru ini.

Justeru kata beliau, selepas mendapat maklumat dari nurseri, pihaknya mendapat idea memanfaatkan teknologi tersebut dengan menggunakan tanaman hiasan tempatan kerana sesuai dengan iklim negara ini. Untuk tujuan itu, beliau berkata, kekuatan sinaran yang digunakan adalah 35 Grey dengan tempoh dedahan secara purata selama 15 saat.



Benih yang telah didedahkan kepada sinaran kemudiannya ditanam atau dibiakkan menggunakan kaedah kultur tisu.

"Selepas itu kita besarkan dan tanam sebanyak lima kali untuk menyaring benih yang berkualiti yang tidak akan kembali kepada sifat-sifat induk (asal) kerana varieti baharu ini sepatutnya mempunyai ciri-ciri yang lebih baik," ujar beliau lagi.

Dalam pada itu, antara mereka yang mendapat faedah daripada teknologi tersebut ialah **John Sintian** yang mula berjinak-jinak dengan industri tanaman hiasan sejak 2010.

Anak jati Kenunukan Tenompok Bundu Tuhan itu yang merupakan pemegang diploma pereka bentuk dalaman di sebuah pusat pengajian di ibu negara.

Beliau pada mulanya memanfaatkan kepakaran yang dimiliki dengan berkhidmat sebagai pereka dalaman di sebuah syarikat swasta di Kota Kinabalu dan Tawau sebelum membuka syarikat sendiri.

Tidak lama kemudiannya, John terlibat dengan pembukaan

pusat perancangan Hounon Ridge Farmstay and Camping di Ranau yang merupakan perniagaan keluarga. Keputusan itu diambil setelah terfikir untuk kembali ke Ranau untuk memajukan potensi ekonomi yang ada di kampung halamannya pada 2013.

John berkata, sesuai dengan kedudukan Bundu Tuhan dan yang memiliki keindahan semula jadi, dia merasakan bahawa membabitkan diri dalam projek pelancongan berasaskan alam sekitar amat sesuai.

Kekerapannya mengunjuti pelbagai pameran termasuklah yang dianjurkan oleh Nuklear Malaysia membawanya kepada penglibatan dalam bidang tersebut dengan lebih serius.

Dia mendapat maklumat mengenai kejayaan agensi berkenaan dalam bidang baik baka tanaman. Bermula dari situ, kedua-dua pihak mula bekerjasama menerusi Koperasi KI Nabalu melibatkan 21 peserta kesemuanya.

Pada 2016, John memulakan kerja-kerja pembinaan di kawasan seluas 1.2 hektar (tiga ekar) di Bundu Tuhan dengan

kos keseluruhan termasuk infrastruktur sebanyak RM200,000.

Menerusi projek tersebut dia menanam orkid dan bunga kekwa dan memanfaatkan pusat nurseri milik MOSTI yang ada sebagai tempat pembiakan.

Dia juga menyertai kursus berkaitan penanaman, pembiakan dan pemasaran bunga hiasan selama seminggu yang dianjurkan oleh Jabatan Pertanian dan agensi berkenaan.

"Saya merancang membina kemudahan chalet atau kabin sebanyak 18 unit berkonsepkan taman yang akan dilaksanakan secara berperingkat-peringkat," ujarnya.

Setakat ini, bunga orkid dan kekwa yang dihasilkan mendapat sambutan dan dijual di pasar tamu dan gerai, manakala spesies lain yang dirancang untuk dikomersialkan adalah tulip, ros dan *carnation*.

"Saya berharap supaya ahli koperasi bersatu memajukan industri bung kekwa yang mempunyai potensi di pasaran, ujarnya yang kini mempunyai lapan pekerja.



ZAITON AHMAD menunjukkan tanaman mutan yang dibiakkan dengan menggunakan kaedah kultur tisu.

LAMPIRAN 2
UTUSAN MALAYSIA (MEGA SAINS) : MUKA SURAT 15
TARIKH : 21 MEI 2018 (ISNIN)

Hasil pelbagai varieti tanaman

BAGI Zaiton Ahmad, teknologi aruhan mutasi memang dimanfaatkan oleh Agensi Nuklear Malaysia bagi menghasilkan pelbagai varet (jenis) tanaman sejak dahulu lagi terutama yang berpotensi untuk dikomersialkan.

Dalam industri tanaman hiasan, pihaknya memilih kekwa kerana ia cepat matang, manakala bunga raya kerana kedudukannya sebagai bunga kebangsaan. Bunga kekwa dan orkid boleh dijual sebagai pokok pasuan atau bunga keratan.

Agensi berkenaan juga pernah menghasilkan rumput varet kluang comel dan padi, serta stevia menggunakan teknologi tersebut.

Tanaman lain, kata beliau, antaranya nenas dan pisang.

Menurut beliau lagi, varet tanaman baharu atau mutan itu mempunyai beberapa ciri-ciri yang lebih baik, antaranya daya ketahanan terhadap penyakit dan cuaca ekstrem, manakala hasil buah lebih manis dan besar.

Selain itu, kadar tumbesaran juga lebih cepat dan tanaman yang dihasilkan selamat untuk



JOHN SINTIAN (tengah) memberi taklimat mengenai perkembangan projek tanaman hiasan varet baharu kepada penyelidik dan pegawai Agensi Nuklear Malaysia di Bundu Tuhan, Ranau, Sabah baru-baru ini.

digunakan.

Projek MSI merupakan pakej pemindahan dan penanaman hasil biak baka mutasi hiasan agensi berkenaan untuk menjana ekonomi komuniti atau kumpulan sasaran.

Pakej penanaman yang diberi

kepada penduduk Bundu Tuhan itu juga meliputi penggunaan produk-produk biobaja dan penggalak pertumbuhan ologokitosan yang dibangunkan untuk meningkatkan kualiti hasil bunga dan membantu menawal serangga perosak.

VARIETI MUTAN DIHASILKAN

- Orkid
- Kekwa
- Bunga raya
- Pokok amarilis (pokok ili)
- Pokok juang-juang
- Petunia

Ciri ciri yang ada pada varet baharu

- Warna yang menarik atau unik.
- Tangkai panjang.
- Bunga lebih tahan lama dan banyak.
- Sesuai untuk eksport dan tidak mudah patah.



ORANG ramai diberi penerangan mengenai teknik biak baka mutasi.

OBJEKTIF PROJEK

- Memindahkan anak benih pokok bunga mutan serta pakej penanaman kepada komuniti.
- Membangunkan rumah teduhan untuk penanaman bunga mutan.
- Memberi latihan amali penanaman, pembiakan dan penjagaan pokok bunga mutan kepada komuniti.

IMPAK KEPADA KOMUNITI

- Meningkatkan kemahiran dalam penanaman dan pengusahaan bunga hiasan untuk menjana pendapatan tambahan kepada komuniti.

LAMPIRAN 3
THE STAR (VIEWPOINT) : MUKA SURAT 11
TARIKH : 19 MEI 2018 (SABTU)

My wishlist to Dr Mahathir and Guan Eng

On your own
TAN THIAM HOCK

starbiz@thestar.com.my



DEAR Dr Mahathir

IT is difficult to congratulate you for your self appointment as the next Education Minister. Not especially with Tun Dr Siti Hasmah Mohd Ali being unhappy that you have broken your promise not to take up an additional portfolio as you already have the heavy job of a Prime Minister. You have hardly slept the past week and the nation is worried about your health.

So with it with great relief that you have decided to pass the baton to Dr Maszlee Malik before the starting line. Nevertheless, many are pleased that you have thought about it as the future of this country rests upon your wise decision and a firm hand.

As you have combined the two education ministries into one, you can now chart a seamless education for a child from standard one to university. Re your online software lessons, it will open up content possibilities different from the dreary textbooks. Digital technology will enable scaling in terms of different subjects, multiple age groups and in different languages. It will open up the young minds.

However please ban political themes in primary and secondary schools. Reinroduce Rukunegara and moral teachings. Mastering science, maths and English will enhance personal intellect.

Religious indoctrination should be put aside while teachers and lecturers should stay religion neutral. All academic disciplines in universities should be recalibrated to produce graduates with the right skills to be hungry and job ready.

I do have one wish. Please set up a Council of Eminent Historians. Yes they say History is written by Victors but this was because in those days, it was difficult to archive manuscripts. But our history is young, we have computers and gigabytes of storage memory. And the Council should review all the history books in schools and replace the fake facts with true facts.

The future belongs to those who learn from the past and live brilliantly.

Those who cannot learn from history are doomed to repeat it. Hopefully our recent bad chapter in history will never be repeated.

What's done is done. Right actions in the future are the best apologies for bad actions in the past.



Top leaders: Prime Minister Dr Mahathir (left) and Finance Minister-designate Lim.

Anyway Tun, you will always be remembered in our history as the PM who came in from the past to save our future. And may God bless you with many more healthy years.

DEAR Lim Guan Eng

Congratulations for being appointed as the Finance Minister-designate. According to Datuk Seri Anwar Ibrahim in his homecoming speech on Wednesday, as a past Finance Minister, he found the job to be difficult and complex.

Maybe that is why you were picked for the job. When the country is having a major cash flow problem, it is time to pick a prudent Malaysian accountant to helm the Ministry.

That Tun Dr Mahathir Mohamad picked you for this post, he must have had tremendous confidence in your ability and your integrity. You yourself have had meetings with the Ministry officials in the last few days and discovered that the problems in the Ministry especially the 1MDB debts are deeper and wider than expected.

But financial debt is not your only problem. In an article by *Digital News Asia* just two days ago, the former secretary-general Tan Sri Serigar Irwan was described as the pillar of the startup ecosystem in Malaysia. Besides being the Board Chairman of Malaysian Global Innovation and Creativity Centre (MaGIC), his contribution, support and commitment towards the startup ecosystem has not been matched by any senior civil servant.

Well this is all admirable as Malaysia moves

into the digital technology space, one wonder why MaGIC (MoF Incorporated) is under the purview of Finance Ministry and not under the Science, Technology & Innovation Ministry? It is akin to Maybank CEO appointing his chief financial officer to be in charge of its Innovation Lab when a chief innovation officer has already been employed.

Similarly Malaysia Digital Economy Corporation (MDEC) another MoF incorporated company is under the purview of your Finance Ministry.

You will be pleased to know that MDEC was formerly known as Multimedia Development Corporation launched by your new boss Dr Mahathir back in 1996 under the purview of Science and Technology Ministry which was transferred to Communications and Multimedia Ministry and finally landed under Finance Ministry. Lucky you.

Should you decide to keep this two MoF incorporated companies under the purview of your Ministry, may I suggest you hire an additional secretary-general who is technologically qualified to oversee these two important subsidiaries.

I would strongly advise that your first secretary-general to be a highly qualified accountant to help you solve the massive financial problems and ensure that he is not distracted by all these digital jumbo mumbo from performing his task at hand.

When you next walk into your new office, perhaps you would like to verify an article by *The Edge* dated Jan 8th 2018 that another MoF company may have acquired a 51% stake in Mulia Property Development Sdn Bhd (for an undisclosed amount) which is developing The

Exchange 106 skyscraper at the Tun Razak Exchange. You might need another assistant who is well versed in property development which I believe you will not find it difficult to find among our civil service team.

It would be advisable that you also check with your boss the financial commitments of all the big infrastructure projects that are under the purview of the PMO office like ECRL, Bandar Malaysia, TRX etc. All which leads to a great opportunity to cut costs at other Ministries since they are left with hardly any major projects to manage.

As recommended by your DAP colleague Liew Chin Tong, Malaysia does not need so many Ministries since PMO and the MOF have taken over so many functions on their behalf. In view of the budget constraint, you can merge some of the mini Ministries, either into a 2 in 1 or even 3 in 1 thus reducing redundancy.

If your Pakatan Harapan government can reduce the financial deficits despite zero rating GST, I am sure Harvard Business School will write one its best Management, Finance and Leadership case studies for its world class students.

Talking about GST, you caught the market by surprise by zero rating GST from June 1. While it is an admirable action taken in view of the coming Hari Raya celebrations, most of the SMEs are confused and feeling a bit lost. It will be good if you can bring back Datuk Ahmad Maslan to explain to us how zero rating the GST will bring down retail prices.

I have advised my trading companies to reduce the recommended selling price by 6% for ALL products or as close as possible due to the rounding up of the odd cents which means a savings of 5.8% to 5.99% reduction from the selling price.

However, some of our products will be charged a sales tax of 10% when you implement the 10% sales and service tax. At that time, I will advise my trading companies to raise the recommended selling prices on the affected products accordingly. Kindly advise your still unnamed Trade Minister colleague to restrain his officers from threatening us with profiteering as we are just following the government's flip-flop policies.

I have a humble wish to make. With our neighbouring Asean countries forging ahead with investments in startup ecosystem and national digital initiatives, Malaysia must not fall behind in this race to the future. It would be advisable for this government to continue funding a sizable annual budget towards supporting an innovative and vibrant digital economy.

A well-run ecosystem will produce many digital entrepreneurs. What is required is to institute good governance, transparent policies and open tenders.

I would however like to extend my appreciation for your 'nampak banyak teruk tetapi mesti buat jugak' attitude. You will survive. Lucky us.

LAMPIRAN 4
HARIAN METRO (NUANSA) : MUKA SURAT N33
TARIKH : 20 MEI 2018 (AHAD)



PELAJAR Maktab Rendah Sains Mara (MRSM) Mersing menerima hadiah bagi Juara Keseluruhan MINI SCITECH 2018.

200 pelajar daripada 24 sekolah menengah seluruh negara sertai MINI SCITECH 2018

Fazurawati Che Lah
 fazurawati@hmetro.com.my

Pertandingan MINISCITECH 2018 anjuran Universiti Teknologi Mara (UTM) Cawangan Selangor berjaya mengaplikasikan pendidikan Sains, Teknologi, Kejuruteraan dan Matematik (STEM) kepada pelajar sekolah.

MINI SCITECH anjuran Jabatan Pendidikan Sains dan Science Education Society (SEEDS), Fakulti Pendidikan UTM itu turut mendapat kerjasama Kementerian Pelajaran Malaysia (KPM) disertai lebih 200 pelajar daripada 24 sekolah menengah dari seluruh negara.

Penganjur Program, Muhd Fattuhul Anwar Abdul Rahim berkata, MINISCITECH 2018 adalah program yang menerapkan aplikasi pendidikan Sains, Teknologi, Kejuruteraan dan Matematik (STEM).

Katanya, pertandingan itu selaras dengan hasrat kerajaan untuk mengangkat pendidikan STEM dan meningkatkan minat terhadap mata pelajaran itu dalam kalangan pelajar.

"Empat kategori dipertandingkan iaitu Drama Sains, Reka Cipta dan Inovasi, Kapal Terbang Kertas dan School Lab.

"Pertandingan Kapal Terbang Kertas antara pertandingan baharu yang diperkenalkan dan mendapat sambutan luar biasa dalam penganjuran



PELAJAR menyediakan kapal terbang kertas sebelum pertandingan.



AIDIE (kanan) ketika pelancaran Majlis Perasmian dan Penutup MINISCITECH 2018

kali ini," katanya.

Pada pertandingan itu, MRSM Mersing, Johor menjadi Juara Keseluruhan MINI SCITECH 2018.

Bagi johan setiap kategori dimenangi Sekolah Menengah Kebangsaan (SMK) Taman Tasik, Kuala Lumpur (Drama Sains), SMK Tinggi Klang, Selangor (Kapal Terbang Kertas), Sekolah Menengah Agama Kuala Selangor, Selangor (Rekacipta dan Inovasi) dan MRSM Mersing, Johor (School Lab).

Program itu dirasmikan Timbalan Pengarah Bahagian Pengurusan Sekolah Berasrama Penuh dan Sekolah Kecemerlangan Kementerian Pelajaran Malaysia (KPM), Aidie Jantan.

Muhd Fattuhul Anwar berkata, sambutan MINISCITECH 2018 kali ini luar biasa dan menunjukkan peningkatan yang signifikan berbanding penganjuran SCITECH pada tahun lalu.



PESERTA pertandingan Drama Sains Peringkat Akhir dari Sekolah Menengah Kebangsaan Taman Tasik Ampang.

Small helicopter will hitch a ride to Mars with Nasa's next rover

By KAREN KAPLAN

ROVING around Mars is so passe. So Nasa is sending a helicopter to the Red Planet. The aptly named Mars Helicopter will attempt to become the first vehicle to take flight on another planet.

"The idea of a helicopter flying the skies of another planet is thrilling," Nasa Administrator Jim Bridenstine said in a statement.

The craft, which looks more like a drone than a helicopter, has a fuselage the size of a softball, two sets of blades that rotate in opposite directions, solar cells to charge its lithium ion batteries, and four skinny legs with spherical feet. The whole thing weighs in at less than 1.8kg.

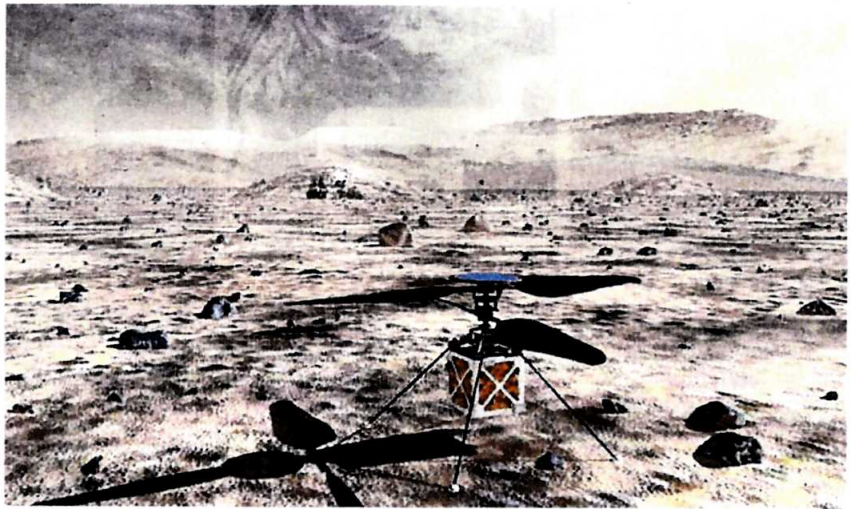
Thanks to the thin Martian atmosphere, the helicopter's blades will encounter far less air than they would on Earth. In fact, to find conditions equivalent to those on Mars, you'd have to fly at 30,000m – about 18,000m higher than a helicopter has ever flown, said MiMi Aung, the Mars Helicopter project manager at NASA's Jet Propulsion Laboratory in La Canada Flintridge, California.

"The atmosphere of Mars is only 1% that of Earth," Aung said in a statement. "To make it fly at that low atmospheric density, we had to scrutinise everything."

To get airborne, the four blades on the Mars Helicopter will make nearly 3,000 rotations per minute.

That means they will spin about 10 times faster than a helicopter built for our skies.

Nasa plans to fly the craft up to five times over a span of 30 days. For its maiden voyage, the goal is to hover 3m above the ground for about 30 seconds. If all goes well, its final flight will cover a distance of several football



The Mars Helicopter, depicted in this artist's rendering, will hitch a ride to the Red Planet with Nasa's Mars 2020 rover and attempt to become the first craft to take flight on another planet. — Nasa/TNS

fields over a period of 90 seconds.

The helicopter won't fly to Mars alone. Instead, it will hitch a ride in the belly pan of JPL's next Martian rover, which is scheduled to launch in July 2020.

After their arrival the following February, the rover – known as Mars 2020 – will set the helicopter on the ground and drive a safe distance away. However, it will remain close enough to relay commands from Earth to the helicopter.

Engineers at JPL began working on the Mars Helicopter in 2013 and spent four years

coming up with the final design. Nasa is calling it a "high-risk, high-reward project" whose failure would not affect the primary Mars 2020 mission.

However, if it works, helicopters could become a crucial tool for exploring Mars in the future, said Thomas Zurbuchen, associate administrator of Nasa's Science Mission Directorate.

"The ability to see clearly what lies beyond the next hill is crucial for future explorers," Zurbuchen said in a statement. — Tribune News Service

LAMPIRAN 6
THE STAR (SCIENCE) : MUKA SURAT 8
TARIKH : 21 MEI 2018 (ISNIN)

Celestial cradle

Scientists develop a 3-D view of an interstellar cloud, where stars are born.

By AMINA KHAN

TWO astronomers from Greece have managed to model the three-dimensional structure of an interstellar gas cloud, and found that it's on the order of 10 times more spacious than it originally appeared.

The shape and structure of Musca, described in the journal *Science*, could help scientists probe the mysterious origins and evolution of stars – and by extension, the planets that surround them.

Finding the 3-D structure of such clouds "has been a 'holy grail' in studies of the interstellar medium for many years now," said senior author Konstantinos Tassis, an astrophysicist at the University of Crete.

Interstellar clouds serve as the celestial cradles for nascent stars, which condense out of these enormous conglomerations of gas and dust. These cold, dusty, magnetised clouds can reach a million times the mass of the sun. But because they're filled with molecular hydrogen that blocks the light of background stars, they typically appear as holes in an otherwise bright night sky. They're more easily studied using infrared light.

But even in infrared light, these clouds are difficult to study because we can see them only as flat structures, even though they're actually three-dimensional. We know very little about how dense they are, what shape they are and how they're organised inside.

"All sorts of different physical and chemical processes take place in their interior, and as a result, the process of star formation is poorly understood," Tassis said in an email. "How does a giant cloud of a million solar masses

break up into smaller pieces, and how do these fragments condense into stars similar to our sun? What makes a cloud form a lot of small stars or a few larger ones?"

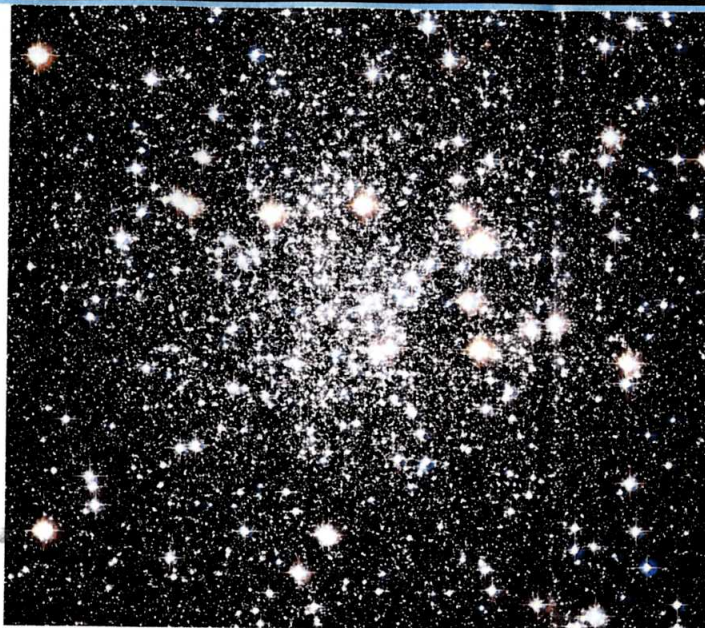
"These problems, although they are directly related to the question of the origin of our sun, our planet, and, ultimately, ourselves, are still very much a mystery," he added.

About a decade ago, astrophysicist Paul Goldsmith of the Jet Propulsion Laboratory in La Canada Flintridge and his colleagues discovered strange hair-like wisps surrounding such gas clouds, rather like the cilia of a bacterium. Amid the chaos of a gas cloud, these ordered structures drew astronomers' attention. How did they form, and why?

"Understanding how you make new stars is really a critical challenge for modern astrophysics," Goldsmith, who was not involved in the new paper, said in an interview. "These molecular clouds are where new stars are formed, and so understanding the structure of these clouds, and how deep they are, what their three-dimensional structure is, is obviously critical for understanding the whole picture."

While completing his doctoral work at the University of Crete, lead author Aris Tritsis (now a postdoctoral fellow at Australian National University) concluded that these striations were actually caused by magnetic waves leaving their imprint on the cloud's gas.

"It was then that we realised that these striations might encode a global vibration if the cloud is isolated, a 'song,' a pattern of frequencies that could reveal the true, 3-D shape of the cloud," Tassis said.



Located approximately 22,000 light-years away in the constellation of Musca, this tightly packed collection of stars known as a globular cluster goes by the name of NGC 4833. — Nasa/TNS

To try and use those magnetosonic waves to understand the shape of an interstellar cloud, they pulled data from the European Space Agency's infrared Herschel Space Observatory, which can see into the infrared.

They focused on Musca, which lies in the Southern Hemisphere roughly 500 light-years from Earth.

Musca, a filamentary cloud that's long and thin, made an ideal target because it was relatively

isolated. This meant that its striations were unlikely to have been warped by "noise" coming from nearby structures, Tassis said.

Because the waves are basically trapped within the interstellar cloud, the wavelength

will actually hold information about its dimensions. After using the striations to determine the wavelength of this "global vibration," the scientists were able to determine the true shape of this gas cloud.

From our vantage point, Musca looks like a needle. But the magnetosonic waves revealed that the gas cloud actually was shaped like a pancake – one we were viewing edge-on. All in all, the cloud seems to measure roughly 24 light-years wide by 18 light-years across and one light-year thick.

"In much the same way that a piccolo flute makes a much different sound than a tuba (the air vibrates with different frequencies in the two cases because the shape and size of the instruments are very different), a pancake-shaped cloud vibrates in a tune that is very different than that of a needle-shaped cloud," Tassis said. "Musca very clearly vibrates like a pancake, not a needle. It is not a subtle effect, it is eye-popping!"

This meant that the gas cloud was far more voluminous than previously thought – roughly on the order of 10 times larger, Tassis said. And because the same amount of gas filled that bigger-than-expected space, it meant the cloud was much less dense than scientists had expected.

"It was a huge surprise to us," Tassis said. Goldsmith, whose team originally identified the existence of striations, praised the work.

"This is great. This is exciting," the astrophysicist said. "Now we have to figure out if we can confirm that by some other kind of measurement."

The discovery that Musca is a pancake and not a prototypical needle-like filament totally changes scientists' understanding of the balance of forces that shaped this gas cloud and influenced its star-forming process, Tassis added.

For one thing, a less dense gas cloud would have a much lower rate of star formation. On top of that, the molecular demographics of sparser clouds are different from denser ones. Dense clouds, for example, are more likely to have nitrogen-based molecules such as ammonia. — Tribune News Service