OSFS Statement.

Newsletter of the **Ottawa Science Fiction Society June 2014,**
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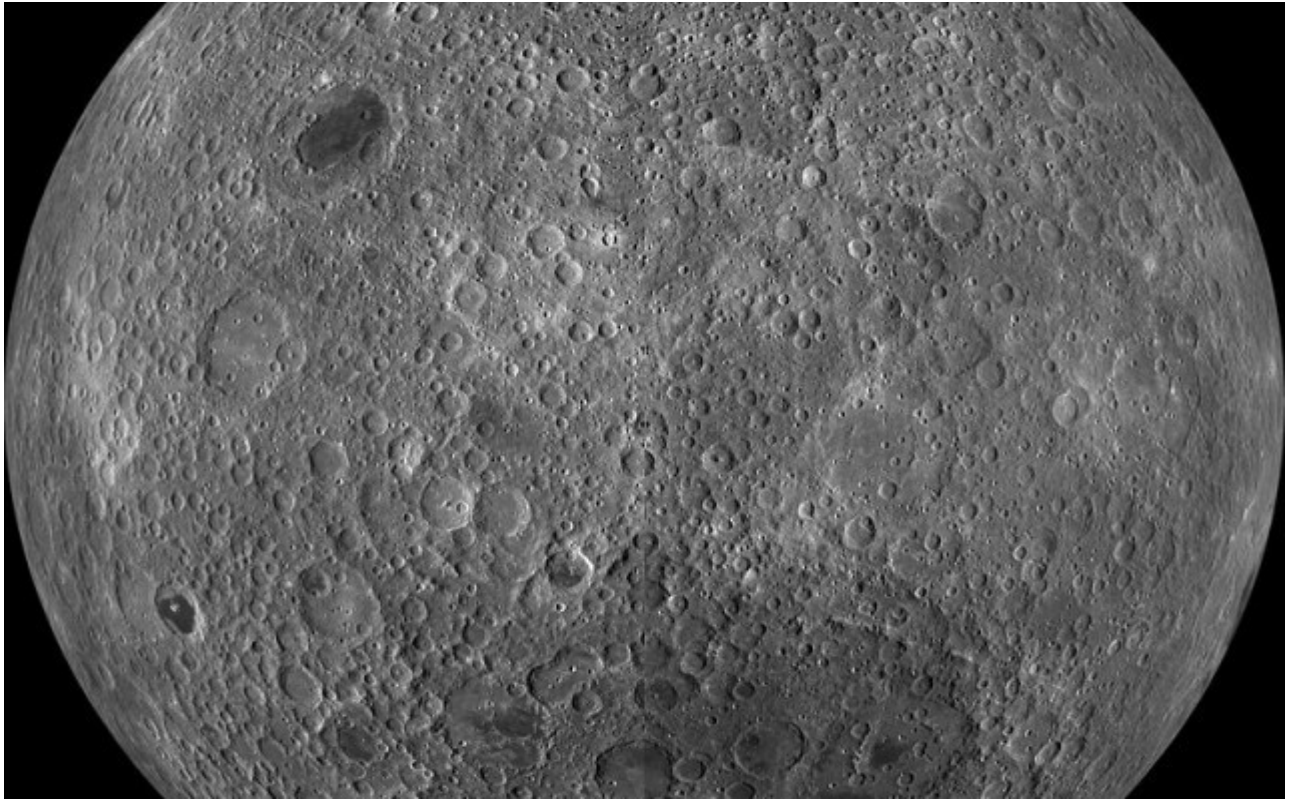

The far side of the moon. Photo credit: NASA/GSFC/Arizona State University

There have been speculations for centuries over what the other side looked like; the sort of question that obsesses the human mind when there is no way to get an answer. A consensus of sorts held that it would look the just the same only different; i.e. differing only in small details. When the Russians released the images there was consternation in scientific circles and the fringe conspiracists had a field day. Why? Well mainly because there were no dark basalt flooded basins so conspicuous on the near side. There were those who claimed, on the basis of certain technical glitches in pasting the many images together, that the whole thing was one big painting and in truth there does seem to be a most unlikely six rayed star in this image above. Can anyone else see it? {Ed.}

Membership information

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Rates

Regular

Family

Extraordinary & Senior

Contents

Pub by: Ottawa Science Fiction Society, Creators of Maplecon

Editor's Blather:

A lot of catching up to do; items that missed last issue, items that seem to go together, and some that I messed up and am reprinting.

FOR YOUR VIEWING PLEASURE
Jupiter lies very low in the sunset glow, Saturn and Mars lie high in the south and Venus rises about 4 am. The Moon will reach Last Quarter on the 19th.
Ken Tapping is an astronomer with the National Research Council's Dominion Radio Astrophysical Observatory.

MOVIES List submitted by Sandi Marie
Coming to Your Theatre in
JUNE

Transformers: Age of Extinction - Jun 27

JULY

Maleficent - Jul 2
X-Men: Days of Future Past - Jul 18
Dawn of the Planet of the Apes - Jul 18
Hercules: The Thracian Wars - Jul 25

To come in due time … Elfstones of Shannara.

Coming Events List submitted by Lloyd Penney

June 22	The Bards of the Byward in front of the EQ3 furniture store on George St. across from the Freiman Mall entrance to the Bay store. Mike Young, Ian Shaw, Martin Buneo, Bob Barclay and Alex Binkley will be glad to sell you books, answer questions or engage in witty conversation. The buskers near us are usually entertaining.
June 28	Steam on Queen, Campbell House, Toronto. Steampunk bazaar. www.steamonqueen.ca.
June 28	Oshawa Anime Festival/Comic Con/Toy Show, 15 Harmony Rd. N., Oshawa. $5 admission, hours 10am-6pm. www.popculturecanada.ca.
July 4-6	Polar Chill 2, Holiday Inn Toronto International Airport, Toronto. Includes the 2014 Constellation Awards. www.tcon.ca.
July	TFcon 2014, Delta Meadowvale Hotel and Conference Centre, Mississauga. Transformers toy

11-13	convention. www.tfcon.ca.
July 13	Oshawa Comic Con, 15 Harmony Rd. N., Oshawa. $5 admission, hours 10am-3pm. www.popculturecanada.ca
July 17-20	Detcon 1, Detroit Marriott at the Renaissance Center, Detroit, MI. North American Science Fiction Interim Convention (NASFiC). Guests:Steven Barnes, John Picacio, Bernadette Bosky, Arthur Hlavaty, Kevin J.Maroney, Helen Greiner, Bill and Brenda Sutton, Roger Sims, Fred Prophet. www.detcon1.org.
July 18-20	Ryu-Kon 2014, Buffalo Niagara Convention Centre, Buffalo. Anime/gaming/horror/steampunk convention. Guests: Riley Schillaci, more. www.ryu-kon.com.
July 18-20	ConBravo!, Hamilton Convention Centre & Sheraton Hotel, Hamilton. Gaming/cosplay convention, more. Guests: Angry Joe, DJ Cutman, more. www.conbravo.com.
Aug 1-3	Condition vs. The Monsters, Four Point by Sheraton Hotel, London, ON. Furry convention. Guests: Sigil, Wolfbird, Dixie von Fur. For more information, www.conditionfurry.ca.
Aug 14-18	Loncon 3/72nd World Science Fiction Convention, ExCeL, London, UK. Guests: Iain M. Banks, John Clute, Malcolm Edwards, Chris Foss, Jeanne Gomoll, Robin Hobb, Bryan Talbot. www.loncon3.org.
Aug 16-17	Ottawa Mini Maker Faire, Canada Science and Technology Museum www.makerfaireottawa.com
Aug 28-31	Fan Expo Canada, Metro Toronto Convention Centre, Toronto. 20th anniversary event. www.fanexpocanada.com.
Sept. 5-7	Fan Events Forum, International Plaza Hotel, Toronto. Con runners' convention. More information TBA, sponsored by Anime North.
Sept. 7	Oshawa Comic Con, 15 Harmony Rd. N., Oshawa. $5 admission, hours10am-3pm. www.popculturecanada.ca.
Sept. 12-14	Steampunk event, name unknown, somewhere in the GTA.
Sept. 19-21	RocCon 2014, Kodak's Theatre on the Ridge, Rochester, NY.Comics, gaming, SF and anime convention. Guests: Brent Spiner, Alaina Huffman, Vic Mignogna, Bonnie Piesse.

	www.rochesterscifianimecon.com.
Sept. 26-28	JemCon, Airport Hilton, Mississauga. Convention about Jem cartoons and toys. www.jemcon.org.
Oct 3-5	CanCon 2014, Ottawa Sheraton Downtown hotel. 150 Albert Street, . Literary SF convention. Guest: Jo Walton. www.can-con.org.
Oct 10-12	Creation Salute to Supermatural, Toronto Weston Harbourcastle, Toronto. Guests: Jensen Ackles, Jared Padalecki, Misha Collins. For more information, www.creationent.com.
Nov. 7–9	Hal-Con 2014 - 1800 Argyle St., Halifax, NS Kristian Nairn, J Torres, Garrett Wang, Michelle Forbes, Morena Baccarin, Dan Parent, Doug Savage, Hope Nicholson & Rachel Richey, Peter Chiykowski, Riki LeCotey (Riddle), Fat Apollo (Michael McCluskey) - http://hal-con.com/
Nov 14-16	SFContario 5, Ramada Plaza Hotel, Toronto. Guests: Robin Hobb, James Murray. www.sfcontario.ca.
Nov 22-23	Toronto Mini Maker Faire 2014, Toronto Reference Library. makerfairetoronto.com.
January, 16-18, 2015	ConFusion 41, Hotel TBA, Detroit area. Guests: Karen Lord, Dr. Cynthia Chestek, Heather Dale, Monte Cook, Shanna Germain, Aaron Thul. www.confusionsf.org or https://es-es.facebook.com/CanadianConventionNetwork
April 16-19	FilKONtario 25. Filk convention. www.filkontario.ca.
Aug 19-23, 2015	Sasquan/73rd World Science Fiction Convention, Spokane Convention Center, Spokane, WA. Guests: David Gerrold, Leslie Turek, Tom Smith, Vonda McIntyre, Brad Foster. www.sasquan.org or worldcon.org.
Oct 2017	Bouchercon XLVIII, Hotel TBA, Toronto. World Mystery Convention. Guests: Louise Penny, Chris Grabenstein, Twist Phelan, Gary Phillips. www.**bouchercon**.info

Sunburst Award Shortlist 2014 www.sunburstaward.org.

The short-listed works in the adult category are:

Sister Mine by Nalo Hopkinson (Grand Central Publishing) River of Stars by Guy Gavriel Kay (Penguin Group Canada) This Strange Way of Dying by Silvia Moreno-Garcia (Exile Editions) A Tale for the Time Being by Ruth Ozeki (Penguin Group Canada) The Demonologist by Andrew Pyper (Simon & Schuster)

The short-listed works in the young adult category are:

Sorrow's Knot by Erin Bow (Scholastic Inc.) The Cats of Tanglewood Forest by Charles de Lint (Little Brown Books) Homeland by Cory Doctorow (Tom Doherty Associates) The Path of Names by Ari Goelman (Scholastic Inc.) Urgle by Meaghan McIsaac (Cormorant Books)

Additionally, the jury has chosen to include a list of Honourable Mentions

The n-Body Problem by Tony Burgess (Chizine Publications) The Luminaries by Eleanor Catton (McClelland & Stewart) The Oathbreaker's Shadow by Amy McCulloch (Doubleday Canada) Wild Fell by Michael Rowe (Chizine Publications) Beyond the Rift by Peter Watts (Tachyon Publications)

The awards will be presented in the fall of 2014.

The Sunburst Award for Excellence in Canadian Literature of the Fantastic is an annual award celebrating the best in Canadian fantastic literature published during the previous calendar year.

The winners receive a cash prize of $1,000 as well as a hand-crafted medallion incorporating the Sunburst logo. The Sunburst Award takes its name from the debut novel of the late Phyllis Gotlieb, one of the first published authors of contemporary Canadian speculative fiction.

A Computer has passed The Turing Test for the First Time
http://techrevu.com/php/Review-id.php?id=6130

This is big. A computer has successfully managed to fool a bunch of researchers into thinking that it was a 13-year-old boy named Eugene Goostman. In doing so, it has become the first computer in the world to have successfully passed the Turing Test.
The test is named after computer pioneer Alan Turing. To pass it, a computer needs to dupe 30 percent of human judges in five minute text-based chats, a feat that until now had never been accomplished.
"Eugene" was created by a team based in Russia, and passed the test organized by the University of Reading just barely, by duping 33 percent of the judges. It should also be noted that successfully pretending to be a 13-year-old boy for whom English is a second language ain't exactly Hal 9000.

[True, but talking for five minutes to some 13 year olds, or some researchers for that matter, can leave you wondering what planet they came from. (The answer, sad to say, is usually obvious.) And be aware that 33% just means one judge in a group of three. Ed]

LOC

Dear OSFen:
Today is Yvonne's and my 31st wedding anniversary! Gifts have been exchanged and opened, and we've done a little shopping, and we are waiting to go out for dinner tonight, but I thought I could whip up a quick loc on issue 421 of the Statement.
Any of the Shannara books would make a good movie, but if there is a series, please don't stretch it out too far to try to squeeze as much money out of the books as possible. I wish The Hobbit has been cut down to two movies. I loved LotR, but The Hobbit, I skipped the second movie, and might just skip the final one.
Yvonne and I attended Anime North the last weekend. We're not anime fans, but we do know that there's a fair number of steampunks who attend, so we took a table in the Crafters' Corner to sell our steampunk jewelry and other merchandise. We sold $540 of merchandise at CostumeCon, and so we set our goal at the same $540. Instead, $1,050 of jewelry and other goods were sold at AN, and we are more than pleased. Selling your goods is half the fun, and the other half is creating more goods. Our next event is Steam on Queen, and we should just be attending. After that, we've decided on going to ConBravo in Hamilton for

the Saturday only, just to see what it's like.
Some must be tired of the details of my job hunt, because I sure am, but now, I finally found a job. We suddenly have so much to celebrate…
May 28 – Our 31st wedding anniversary
June 2 – My 55th birthday
June 2 – I start a new job at Transcontinental Media
June 16 – Yvonne starts a new job at Crown Wallpaper.
I'd better knock on wood to make sure this isn't all a dream.
That's all for now…it's dinner time. Perhaps next year, we can start travelling a little again, but the bills must be paid now. Take care, and see you next issue.

Yours, Lloyd Penney

Reading Rainbow

LeVar Burton has started a Kickstarter campaign to bring Reading Rainbow back, develop apps for many platforms (Android? PS4? WiiU? Xbox?), and donate it to 7500 classrooms in need.
https://www.kickstarter.com/projects/readingrainbow/bring-reading-rainbow-back-for-every-child-everywhere

continued

REVIEWS:

Last month my review of 'Garbage World' was printed without the Intro, without which parts of it didn't make much sense. Our long-suffering editor Grant Duff agreed to humour me and reprint the whole thing, followed by the second offering bought at the church sale.

INTRO:

On May 8 I went to the rummage sale at First Baptist at Elgin and Laurier. Members of OSFS were offered science fiction and fantasy for half price; fifty cents per book. There were many books, as many under the tables as on top, but I looked through everything. As I intend to embark on some heavy stuff this summer, I found myself attracted to books that looked fun and frivolous, intriguing and piquant; books I could read as dessert or a nice snack to contrast with the main course, cupcakes for the soul.

I had just finished reading Silent Spring by Rachel Carson, so my first cupcake seemed appropriate:

GARBAGE WORLD, by Charles Platt

Garbage World was published in 1967, five years after Silent Spring and also deals with humanity's bad habits. In the asteroid belt the asteroids have been made habitable with artificial gravity and atmospheres. All but one are pleasure asteroids where finicky snobby people live who, though they wouldn't dream of visiting Kopra the garbage world, are happy to send it their trash by unmanned ships, called blimps by the Koprans. The purulent contented populace lives by scavenging and their culture is entirely shaped by garbage.

Then one day a ship from the United Asteroid Belt Pleasure Federation comes to Kopra. Two squeaky clean men climb out, gagging in horror behind their protective gear as they open talks with the uber-filthy inhabitants.

What did these poppinjays want on Kopra? How could the Koprans combat the nefarious plans of the Pleasure People? Could one of the former fall in love with one of the latter? Could toxic waste, ooze and stench doom a romance? Can wallowing in a mud pool smooth the way to erotic joy? Can a world of ick be the venue for adventure? Yes, yes and yes. Charles Platt has done it with vivid scenes and lots of humour.

I quite came to like the Koprans, crusty (and encrusted) hillbillies as they were. They had smarts and knew how to enjoy themselves in grand style. The theme I detected in the book reminded me of The Milk of Paradise by James Tiptree Jr., although I hasten to add that that's where the similarities end.

So if this seems like your kind of cupcake that could relax you after a hard day, hunt down a copy and enjoy. Ooze icing is recommended.

continued

My second serving of fun for the summer of 2014, is this delightful romp by Jon Decles that came out in 1987. I was reading 'And No Birds Sing – A Rhetorical Analyses of Rachel Carson's Silent Spring,' and Decles' book made a nice snack between the essays.

The Particoloured Unicorn by Jon Decles

Most unicorns are white with gold or silver horns, but the our hero Piswyck has his heart set on a resplendent unicorn of many colours, a beast that speaks in iambic pentameter and is bound for the slaughterhouse as unsaleable. Piswyck is after three things in life, and after rescuing the unicorn they both set out accomplish the other two. First he must rescue his love Miranda held on the island of Bermuda by her evil uncle Smagdarone in a castle guarded by a wall of carnivorous jelly and last but not least, he must regain his inheritance from the the evil Countess.

This well-constructed world knows ours (the unicorn loves Mozart and Shakespeare) but has been greatly changed. Much of our present-day complicated technology is absent, for the seas were sundered long ago by the sea-going black elves. All continents and islands are cut off from each other, reachable only by sailing ship or balloon. Genetically engineering though has produced everything from giant spiders, great green sharks, trolls and many other creatures, including of course, unicorns.

Piswyck and his unicorn companion have many adventures told in witty style and full of unexpected twists. There are hang-glider battles, a singing contest won by the unicorn, sword battles and more, but the romantic and inexperienced Piswyck wins through despite himself.

Have fun with this cupcake; multi-hued icing recommended.

Hildegarde Henderson

RED PLANET BLUES

by Robert J Sawyer - Penguin

Alex Lomax is a 'just scraping by' Private Eye with a shady past, working out of a second floor walk-up office, whose day seems to be looking up when a gorgeous, rich, female client walks in asking him to help her find her missing husband.

Sound familiar? Except, this particular gumshoe is working on Mars and this is a sequel to his MINDSCAN where the technology exists to copy someone's memories and personality into an android duplicate. Have an incurable condition? Tired of being old and feeble? Want an upgrade from your factory original? Just push a button and ...

Suddenly, finding someone has become a lot tougher when they can be anyone.

A better then most entry in Sawyer's bibliography. And, one thing which I found slightly irritating about some of his books, the overdone Canadian product placement/name dropping, is kept in check here.

Good example of the genre, with numerous twists and unexpected turns. I can recommend it as both a science fiction story and a detective novel.

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GODZILLA (2014)

Mention Godzilla to many people and what comes to mind is a series of silly, child-oriented films with stuntmen (and women) in ridiculous rubber suits beating on each other with kung fu moves, throwing in the occasional zap beam for good measure. They forget that the original GOJIRA (1954) was a cautionary, anti-nuclear film and, (we'll ignore the Americanized version with the ill-fitting addition of scenes with Raymond Burr) given the 3effects of the period, a fairly good one.

The franchise has gone up and down since, arguably reaching its low point with the 1998 Emmerich version which was so bad that it forced the Toho studios, who had retired him prior to handing him over to the Americans for their kick at the can, to take him out of retirement for a successful series of movies starting with GODZILLA 2000.

That fans received, a few years ago, the news of another American effort with no little trepidation is, therefore, understandable. This was unwarranted, though as this year's release shows that Hollywood can, upon occasion, get it right.

Critics complain that humans get the short end of the stick, that character development is practically nonexistent. What of it? Anyone who shows up at a

kaiju (giant monster) movie expecting DRIVING MISS DAISY only show how out of touch they are. You do care for some of the people and even root for them (especially the bus driver) but one is under no illusion as to who the star(s) of the film are. And these are no 'man in suit' monsters. They are big, inhuman, and scary. Seen from the point of view of the puny humans scampering from underfoot, they're clearly something you don't want to share the same county with, never mind the same city. And Godzilla? Unlike the Emmerich version which ran and hid from the military, this version doesn't run, he just ignores them. The military, in an unusual fit of intelligence, opt to leave him alone on the basis of they really don't want him angry at them.

I'm planning on seeing it again and look forward to the already rumoured sequel. If they do only half as good a job on that one, it'll still be worth seeing. Oh and, skip the 3D, but do take it in on the big screen. It really helps in getting the scope of what we're up against here.

The StarWolf

Astrophysics:

There is a growing view that the Earth/Moon pair resulted from a collision between two orbiting bodies. Details are scarce but there are two glaring discrepancies in both bodies that offer clues. The moon is now known to have a significant density difference in crustal material between the near side and the far side (often erroneously called the dark side, although if you take the old meaning of "dark" as "unknown" it makes sense). Earth once had a single continent of low density feldspath crust floating on a denser and still semi-liquid basalt mantle that has since broken up and redistributed itself somewhat evenly.

Beyond these few uncontested data there is growing speculation that a Mars sized object, tentatively called Theia, impacted Earth-to-be and, after gravity collected the scraps, left three objects; Earth minus a bit of core and lot of crust, Moon 1 with most of the core of Theia and a portion of Earth's, and Moon 2 with a lot of the crust and possibly Theia's too.

Moon 1 and Moon 2 would have been in similar and quite low orbits around earth but sometime later got together in a low velocity collision that merged them into the current Moon. One calculation put the collision as being like stacking two scoops of ice cream.

There have been many speculations on the Earth-Moon formation by the collision with or capture of another body.

http://www.iflscience.com/space/55-year-old-mystery-about-dark-side-moon-solved#l20I76ttVxFBWzG7.99

Ann Elid

WATER JETS ON CERES

Ken Tapping, 10th June, 2014

In the 1960's we believed that the outer Solar System was a mostly a cold, frozen place. We knew of weather activity and storms on Jupiter and Saturn, and assumed there would be something of the same kind on Uranus and Neptune. However the assorted moons and asteroids out there would be extremely cold balls of rock. The temperatures would be low enough to ensure water would just be another solid mineral making up the rocks. The only big puzzle was Titan, Saturn's biggest moon, because it was known to have an atmosphere.

However, the Voyager flybys of the outer planets in the 1970's showed our lack of imagination. Io, Jupiter's closest large moon has volcanoes jetting out molten sulphur and other materials. Europa, the second closest moon has a deep ocean underlying a thick layer of ice. Triton, the largest moon of Neptune has cryovolcanoes, emitting water vapour and a "lava" consisting of liquid water. Now we view volcanism and cryovolcanism in the outer Solar System as fairly widespread. Moons and asteroids are very unlikely to have the volcanic processes we have here on Earth; they are too small. On them, our sort of volcanism would have ended a long time ago, because small bodies cool much faster than large ones. Their volcanism is driven by tidal forces produced by the giant planets they orbit. The gravitational fields of the giant planets are strong enough to pull any nearby moon out of shape, making it slightly eggshaped. Moreover, if that moon is rotating, it is continuously changing shape. This kneading generates heat. In the case of Io, enough heat to melt the moon's interior. In the case of others, enough to melt or even boil water. We are gradually better understanding the process of tidal heating, and are seeing more subtle signs of it on other moons orbiting close to the giant planets.

However, now Mother Nature has pitched us another surprise to work on. Our idea of tidal heating of small bodies requires the body in jets and clouds of water vapour have been observed on an asteroid, orbiting between Mars and Jupiter,

well away from any large bodies. In 1801, Italian astronomer Guiseppe Piazzi discovered Ceres, the first of the asteroids, small bodies that orbit the Sun in huge numbers, mainly between the orbits of Mars and Jupiter. Ceres has a diameter of about 490 km and orbits the Sun between 2.55 and 2.98 times the Earth's distance from the Sun. At such distances from the Sun, with no tidal heating, we would expect Ceres to be another totally frozen object. However, once again this assumption was wrong. Recent observations made using the Herschel Space Observatory showed Ceres jetting out water vapour and surrounded by clouds of it. That was a surprise. More detailed calculations and laboratory experiments have shown that an icy object closer than five times the Earth's distance to the Sun will be warm enough for ice to evaporate, turning directly to water vapour without ever becoming a liquid. This is another example of something we could have expected if we had just thought harder.

Since water is an essential requirement of life as we know it, the presence of water as other than a rock mineral raises questions about the possibility of life on some of the moons and asteroids in the Solar System. We need to have a closer look. Our Moon has a very dry surface. Being much closer to the Sun than the asteroids, the large daily temperatures have baked the surface dry. However, there may be ice below the surface, and some amateur and professional astronomers have reported seeing something squirting out. So we need to go back there for a closer look too.

DENEB

Ken Tapping, 3 June, 2014

These evenings it is hard to miss a bright, bluewhite star in the eastern sky. This star is Vega, the most conspicuous star of the three making up the Summer Triangle. Scan down towards the eastern horizon you will find the second, Altair, roughly in line with two fainter stars. Now it is easy to find Deneb, the third star. Just scan north and imagine the triangle. It does not look as bright as the other two stars, but there is nothing comparable nearby to compete with it. Although this star might not look that impressive, it is. It

lies about 2,000 light years away and if it were an average star, you would not be able to see it at all.

Deneb is a member of the class of stars known as supergiants. The Sun is a yellow dwarf. Deneb is extremely luminous; with an energy output around 200,000 times that of the Sun. To put that in perspective, let's start by looking at the Sun's energy output. The Sun's total energy output has been determined many times, using measurements made by spacecraft. It is 4 followed by 26 zeroes Watts. Numbers this large are hard to wrap one's mind around. However, we can get something more manageable by using Einstein's equation "E equals mc squared", which tells us how energy and mass are related to one another. We then get the rather stunning result that this amount of energy production can be achieved by total annihilation of four million tonnes of the Sun's material every second. By comparison a large nuclear power station obtains its energy through annihilating less than a millionth of a gram per second. Moreover the Sun has enough fuel to sustain itself through a lifetime of about 10 billion years. We are now roughly halfway through that period. Now let's look at Deneb. It is producing energy at a rate 200,000 times that of the Sun, which can only be sustained by annihilating 800 billion tonnes of itself a second!

The lifetime of a star is pretty well defined by one thing: the amount of material it collects when it forms. Unless there is a nearby companion to snack on, that initial amount of material is what dictates a star's entire life. Increasing the initial mass of a star increases its energy output a lot. A star ten times the mass of the Sun will be 3,000 times more luminous. To be 200,000 times brighter, Deneb has a mass of around 20 times the mass of the Sun. Having only twenty times the mass of the Sun as fuel, and burning it 200,000 times faster, means Deneb's life will be short and tempestuous. It will shine for about a million years and then explode as a supernova, blowing its material off into space. If Deneb has any planets, they won't last long enough for life to evolve very far before being incinerated. However, supergiant stars like Deneb are of critical importance for the existence of planets and living creatures.

When the universe formed, just under fourteen billion years ago, it was extremely hot and compressed. As it expanded and cooled, it eventually reached a point where atoms could form and stay together. However, these first atoms were mostly hydrogen, with some helium. The elements needed to make planets and living things like us did not exist in other than minute traces. Then the first generations of stars formed, mostly giant and supergiant stars that during their short, tempestuous lives, generated as by-products from their profligate energy production most of the elements. When their lives ended in supernova explosions, all the other elements were synthesized. Finally, all this material was ejected into space where it mixed with the great hydrogen clouds, enriching them with everything needed to make our world and us. Deneb and the other supergiant stars are continuing this work.

PANSPERMIA

Ken Tapping, 17th June, 2014

Over the last decade or two we have learned that sending a space mission to another planet is not the only way to get rock samples. Those samples also get here all by themselves. When a body such as the Earth or some other planet is hit by a large object, such as a comet or small asteroid, a lot of material is blasted into space where it orbits the Sun until it hits something, like another planet. For example, we have now a growing collection of rock fragments that have come from Mars and landed on Earth as meteorites. The composition of the rock, plus any liquids or gases that might be trapped in it, are a guide as to where it came from. The frequency with which pieces of one planet get blasted off and then impact another planet have led to a revival of an old idea – panspermia, that life everywhere comes from a common "seed" which is transported from world to world, germinating when conditions are suitable.

Of course the journeys those seeds would have undertaken are unlike any form of travel we know. For us, travel is, or we would like it to be, sitting in a comfortable seat, gently accelerating to a speed that gets the journey over in a

reasonable time, and then gently decelerating to rest, disembarking, and then hoping our luggage made it. This is very different from being blasted off a planet by a gigantic explosion, imposing an acceleration that would pulverize us. Then, exposed to radiation and probably the vacuum of space, the passengers would orbit the Sun for thousands or millions of years. Any survivors of this process will then have to endure the landing, which involves entering the atmosphere of the destination world at tens of kilometres a second. The outer layers of the rock protecting the passengers would melt and be heated to thousands of degrees, and the deceleration would be almost as violent as it was at "takeoff". The trip would end with a high-speed imp act with the ground. What sort of living creatures could possibly survive an ordeal like that? We know for sure that large animals like us could not handle any stage of this method of interplanetary travel.

When in 1969 the astronauts on Apollo 12 visited the lunar lander Surveyor 3, which had been sitting on the Moon's surface since 1967, they removed some components of the lander to take back to Earth. They were surprised to see that Earth bacteria had hitched a ride to the Moon on Surveyor and were still alive. This demonstrated that simple creatures like bacteria can survive for long periods in space, exposed to radiation, vacuum and huge temperature changes. We also now know that bacteria and viruses can survive a wide range of hostile conditions for very long periods by going dormant. However, could they also survive the stresses of takeoff and landing? To find out, bacterial volunteers were put in holes in small pellets of hard, rock-like material and fired from a special gun into a bowl of sand. So in a fraction of a second they were accelerated to several miles a second and then decelerated just as hard. Many survived that too. So it seems that simple life forms can be transported from one planet to another on impact fragments. Stars make all the elements needed for life, and these react in the clouds between the stars to make many chemicals used or needed by living things. This means that many planets forming from this material could be fertile places for life to develop, or provide places for creatures arriving on

meteors to survive and thrive.
The downside at the moment is that although most of us believe life should be widespread in the universe, we only know of one planet with life present on it. Did that life start here or come from somewhere else?

Scientists Have Discovered a Planet They Thought was Impossible

David A. Aguilar (CfA)

The "Godzilla of Earths!" is in the foreground. Behind it is the smaller 'lava world'. Their sun, in the back, appears to have been created only 3 billion years after the Big Bang.

Based on what we know about how solar systems form, researchers thought that a giant rocky planet could not exist. But they just found one that's 17 times Earth's mass. They're calling it the Mega-Earth.

Scientists say the new planet may have "profound implications for the possibility of life" on extra-solar planets, according to a press release from the Harvard-Smithsonian Center for Astrophysics. They announced the finding in a talk at the American Astronomical Society meeting in Boston.

Researchers have always thought Mega-Earths were impossible since any planets that big would attract hydrogen gas, forming a gas planet like Jupiter.

Meet the Mega-Earth

Mega-Earth, also known as Kepler-10c, is 18,000 miles in diameter and 2.3 times as large as Earth. It appears to be as solid as the planet beneath our feet.

Kepler-10c was previously known to astronomers, but they had not yet measured its mass. Due to its size — 2.3 times that of Earth — it was assumed to be a "mini-Neptune," a planet encased in thick gas. But the new observations have confirmed that it is rocky, not gassy.

It orbits an 11 billion-year-old star named Kepler-10 located 560 light years away from Earth. Its year lasts only 45 days.

Interestingly, this solar system is more than twice as old as our own — it was born less than 3 billion years after the Big Bang.

"We were very surprised when we realized what we had found," study researcher Xavier Dumusque, of the Harvard-Smithsonian Center for Astrophysics, said in a press release.

We've always thought a rocky planet is the best place to look for life, since life on a gas giant is hard to imagine. From what they've observed, the planet may also have an atmosphere with thin clouds, another good sign.

A mysterious system

Researchers had previously thought that this kind of planet impossible.

Not only did they think something that big would be a gas giant, but they didn't even think the elements that make up a rocky planet existed in our universe when this solar system was born:

The early universe had only the lighter elements of hydrogen and helium. Heavier elements were forged from these lighter ones in stars over billions of years.

Because of this, many scientists hadn't been looking for rocky planets in these very old solar systems.

"Finding Kepler-10c tells us that rocky planets could form much earlier than we thought. And if you can make rocks, you can make life," study researcher Dimitar Sasselov, of the Harvard Origins of Life Initiative, said in a release.

The mega-Earth isn't the only weird planet in its solar system. There's also a 'lava-world' 1.5 times Earth's size whose year lasts only 20 hours.

http://www.businessinsider.com/rocky-mega-earth-planet-kepler-10c-2014-6#ixzz33Xsh0Y16