THE PUBLICATION OF CHOICE FOR TECHNOLOGY PROFESSIONALS IN NOVA SCOTIA

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Leadership™ in technology

NASA TELESCOPE
Reveals largest batch of Earth-size, habitable-zone planets around single star

UNDERSTANDING AI
The four types of AI: from reactive robots to self-aware beings

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Leadership in technology

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STORY IDEAS WELCOME

Leadership in Technology strives to present news, stories and other content in the course of each year that is of particular interest or pertinence to TechNova members. We rely in part on your input to guide and generate articles. This is your publication and you are always encouraged to contribute.

NEWS: Your technology career is ever-changing. Let others know about the changes and trends in your particular field, discipline or worksite.

PROFILES: Want to share your own story? Leadership in Technology is a great way to demonstrate the ways that members utilize technology in their careers.

FEEDBACK: Write to us and share your viewpoints (members and non-members alike). Write to info@technova.ca or send your letter/article to the TechNova office.

Cover Photo: NASA Spitzer Finds Water Vapor on Hot, Alien Planet. Artist Concept.

From the Editor

Hi everyone, my name is Sam Younis and I'm the new communications director for TechNova. In this capacity I will be taking over as editor of the Leadership in Technology newsletter from Mike MacLean, who is now serving as Vice-President.

As part of the transition Mike and I collaborated on this issue, among a handful of other assignments we've been working on. Among those is an overhaul of the behind-the-scenes components of the website, with the goal of making it more informative and timely for the membership. At present the website is not performing to our satisfaction. Additionally, we are reviewing our use of social media as a form of communication with our members. We have some other projects in the works, with the plan of revealing them at the AGM.

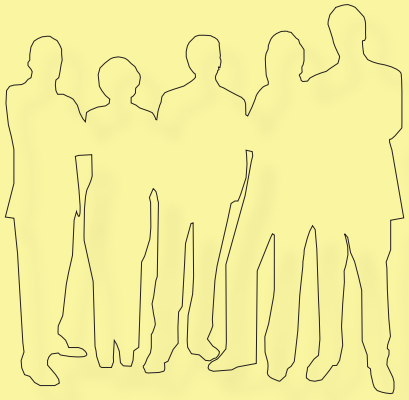
Speaking of the AGM, it's fast approaching. We are in the final stages of planning the event, which is taking place on Saturday, April 8, 2017.

I am excited to take on this new role with TechNova, and I encourage our members to volunteer their time as a member of council, or to sit on a committee as I can assure you it is extremely fulfilling.

See you at the AGM!

Kindest regards,

Sam Younis, CET
Editor, and Communications Director



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TechNova Certified Technology Professionals

VENUE

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65 Cromarty Drive
Dartmouth, Nova Scotia

The President of TechNova
cordially invites you to attend the

2016

Annual General Meeting
Saturday, April 8, 2017

TechNova, representing Nova Scotia's technicians and technologists, has come a long way since its formation in 1967. Thanks to the dedication of its volunteers and the support of its members, TechNova has grown steadily over the past 49 years - both in terms of influence and numbers.

At just 49, TechNova is a young society with bold ambitions and vast, untapped potential. Join President Mark Bamford, CET, Council, and fellow members from across the province for TechNova's 49th AGM. Our Meet & Greet Event is a great opportunity to mingle and network with Council and fellow members and enjoy some refreshments. Then join us for coffee, tea and a continental breakfast before our meeting and lunch Saturday morning. See you there!

REGISTRATION SPACE IS LIMITED. DEADLINE FOR REGISTRATION IS FRIDAY, MARCH 24.

EVENT	DATE	TIME	LOCATION	X
Meet & Greet	Fri. April 7	6:00-10:00 p.m	Hampton Inn & Suites	
AGM	Sat. April 8	10:00 a.m.	Hampton Inn & Suites	
Luncheon	Sat. April 8	12:00 noon	Hampton Inn & Suites	
Guest Speaker	Sat. April 8	1:00 p.m.	Hampton Inn & Suites	

Please let us know if there any special dietary requirements

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☐ Volunteers needed for Council and Certification Board. Please let us know if you are interested in one of these positions by checking the box on the left.

WIN A SMART WATCH OR A DRONE

Members attending will be able to participate in a draw to win a Smart Watch, Drone and more at this year's AGM.

- To claim your prize, you must be present at the time of the drawing.
- Prize photos are for illustrative purposes only, actual prizes may vary.

Name (please print) _____ Membership #: _____

TechNova is the Society of Certified Engineering Technicians and Technologists of Nova Scotia

TechNova Certified Technology Professionals

From the President

Dear Members,

In 2018 we will be holding the 2017 AGM. This is an important benchmark for us as it will mark 50 years since the inception of the Society of Certified Technicians and Technologists of Nova Scotia (SCETTNS) also known as TechNova. We would like to make the 2017 AGM a time to be remembered and to that end we are soliciting any ideas or thoughts on how we can celebrate our anniversary. If you have any suggestions please don't hesitate to contact the office or myself. All the contact information can be found on our website.

On the National level we continue to support a goal of unity in the national accreditation process. To this end there has been a request for a presidents/vice presidents meeting to be held here in Halifax this March. As it is in the best interest of our members and technology professionals across Canada for there to be one educational standard, one of the goals being discussed is a single technical standard for the certification of members across Canada.

One of the questions most often asked by our members is what benefit does being a member of TechNova afford us. There are many cost saving benefits we have in collaboration with our partners but the most significant benefit is when you earn your certification, you also gain the right to use the following protected titles C.E.T., C.Tech and A.Sc.T, these titles show your present and future employers that you have a standard of professionalism and education that will benefit them and their companies. Also under the present mobility agreements your certification is transferable across Canada and under the Sydney and Dublin accords your certification can be recognized in various countries around the world.

Another important task that TechNova helps with is the yearly accreditations of NSCC programs. The accreditations give our students a better chance to find employment here in Nova Scotia, across Canada and even countries throughout the world. CTAB is looking for certified members to complete course accreditations in various campuses both here in Nova Scotia and across Canada. If this is an area that may interest you please contact the office for more details.

Each year TechNova awards a number of bursaries to students attending Secondary Education. We strongly urge parents of students attending secondary school in a technology program to visit our website for more information on the criteria and the application forms. At present there is not a bursary for students whose parents are not members of TechNova, this has been added to our agenda items and we will be addressing this in the near future.

We have the ability to do video teleconferencing following the purchase of a smart board. If you feel you would like to take advantage of this technology and become a member of the council or a member of the certification board please don't hesitate to contact our office.

In closing I would encourage our members to get involved with TechNova. We are always looking for volunteers to help out. There are many ways you can volunteer, from being a councillor as a voting member, serving on the certification board, helping our communications / IT team, offering your expertise as an auditor for CTAB, or volunteering for the AGM committee for next year's 50th anniversary to writing an article for this magazine, every little bit is a big help and very much appreciated.

M. Bamford

Mark Bamford, CET
President

NEW MEMBERS

MAY 2016 - FEBRUARY 2017

Associate Technologists
Dylan Mason
Lilan Lu
Alex Lyman
Cory Stewart

Associate Technicians
Dmitry Kadaner
Navdeep Kaur

Certified Engineering Technologists (CET)
Amanda Hickey
David Dunlop
Carmen Porter
Michelle MacDonald
Jill Hurley
Alex England
Robert Collier
Martha MacGowan
Lukas Wentzell
Kenneth Fleming
Daniel “Kyle” Jones
Caitlin Sampson
Robert Fournier
Erik Van Lunen
Daniel MacPhee
Keltie Land
Stephen Anderson
Ryan Matheson
Thomas Kendell
Lee Hiltz

Certified Engineering Technicians (C.Tech)
Richard Ross
Anthony Mbaabu
Sasha McCormick
Ian Campbell
Blair Doucette
Samuel Beckett
Brandon Dearman
Chaunc Lumsden
Carl Erskine
Chad Foley
Guy Embury
Angela Davis
Ian Anning
Charles Kublek
Cameron Haley
Nathan Bertino
Dennis Pollard
James Lutz
Andrew Swan

Applied Science Technologist (AScT)
Elizabeth Lowe

Upgraded from Associate Technologists to Certified Engineering Technologist
Corey Strong
Jenni Bourassa
Matthew Appleby
Michael MacNeil
Scott Manderson
Andrew Dickson

Students
Liwam Weldemichael
Robert Dean
Sandy Kaizer
Victoria Griffin

Transfers In
Peter Heembrock
Ian Anning
Robert Collier

stronger. together.

GREAT IDEA

Understanding the four types of AI

from reactive robots to self-aware beings

The common, and recurring, view of the latest breakthroughs in artificial intelligence research is that sentient and intelligent machines are just on the horizon. Machines understand verbal commands, distinguish pictures, drive cars and play games better than we do. How much longer can it be before they walk among us?

The new White House report on artificial intelligence takes an appropriately skeptical view of that dream. It says the next 20 years likely won't see machines "exhibit broadly-applicable intelligence comparable to or exceeding that of humans," though it does go on to say that in the coming years, "machines will reach and exceed human performance on more and more tasks." But its assumptions about how those capabilities will develop missed some important points.

As an AI researcher, I'll admit it was nice to have my own field highlighted at the highest level of American government, but the report focused almost exclusively on what I call "the boring kind of AI." It dismissed in half a sentence my branch of AI research, into how evolution can help develop ever-improving AI systems, and how computational models can help us understand how our human intelligence evolved.

The report focuses on what might be called mainstream AI tools: machine learning and deep learning. These are the sorts of technologies that have been able to play "Jeopardy!" well, and beat human Go masters at the most complicated game ever invented. These current intelligent systems are able to handle huge amounts of data and make complex calculations very quickly. But they lack an element that will be key to building the sentient machines we picture having in the future.

We need to do more than teach machines to learn. We need to overcome the boundaries that define the four different types of artificial intelligence, the barriers that separate machines from us – and us from them.

Type I AI: Reactive machines

The most basic types of AI systems are purely reactive, and have the ability neither to form memories nor to use past experiences to inform current decisions. Deep Blue, IBM's chess-playing supercomputer, which beat international grandmaster Garry Kasparov in the late 1990s, is the perfect example of this type of machine.

Deep Blue can identify the pieces on a chess board and know how each moves. It can make predictions about what moves might be next for it and its opponent. And it can choose the most optimal moves from among the possibilities.

But it doesn't have any concept of the past, nor any memory of what has happened before. Apart from a rarely used chess-specific rule against repeating the same move three times, Deep Blue ignores everything before the present moment. All it does is look at the pieces on the chess board as it stands right now, and choose from possible next moves.

This type of intelligence involves the computer perceiving the world directly and acting on what it sees. It doesn't rely on an internal concept of the world. In a seminal paper, AI researcher Rodney Brooks argued that we should only build machines like this. His main reason was that people are not very good at programming accurate simulated worlds for

computers to use, what is called in AI scholarship a "representation" of the world. The current intelligent machines we marvel at either have no such concept of the world, or have a very limited and specialized one for its particular duties. The innovation in Deep Blue's design was not to broaden the range of possible movies the computer considered. Rather, the developers found a way to narrow its view, to stop pursuing some potential future moves, based on how it rated their outcome. Without this ability, Deep Blue would have needed to be an even more powerful computer to actually beat Kasparov.
Similarly, Google's AlphaGo, which has beaten top human Go experts, can't evaluate all potential future moves either. Its analysis method is more sophisticated than Deep Blue's, using a neural network to evaluate game developments.

These methods do improve the ability of AI systems to play specific games better, but they can't be easily changed or applied to other situations. These computerized imaginations have no concept of the wider world – meaning they can't function beyond the specific tasks they're assigned and are easily fooled.

They can't interactively participate in the world, the way we imagine AI systems one day might. Instead, these machines will behave exactly the same way every time they encounter the same situation. This can be very good for ensuring an AI system is trustworthy: You want your autonomous car to be a reliable driver. But it's bad if we want machines to truly engage with, and respond to, the world. These simplest AI systems won't ever be bored, or interested, or sad.

Type II AI: Limited memory
This Type II class contains machines can look into the past. Self-driving cars do some of this already. For example, they observe other cars' speed and direction. That can't be done in a just one moment, but rather requires identifying specific objects and monitoring them over time.

These observations are added to the self-driving cars' preprogrammed representations of the world, which also include lane markings, traffic lights and other important elements, like curves in the road. They're included when the car decides when to change lanes, to avoid cutting off another driver or being hit by a nearby car.

But these simple pieces of information about the past are only transient. They aren't saved as part of the car's library of experience it can learn from, the way human drivers compile experience over years behind the wheel.

So how can we build AI systems that build full representations, remember their experiences and learn how to handle new situations? Brooks was right in that it is very difficult to do this. My own research into methods inspired by Darwinian evolution can start to make up for human shortcomings by letting the machines build their own representations.

Type III AI: Theory of mind
We might stop here, and call this point the important divide between the machines we have and the machines we will build in the future. However, it is better to be more specific to discuss the types of representations machines need to form, and what they need to be about. Machines in the next, more advanced, class not only form representations about the world, but also about other agents or entities in the world. In psychology, this is called "theory of mind" – the understanding that people, creatures and objects in the world can have thoughts and emotions that affect their own behavior.

This is crucial to how we humans formed societies, because they allowed us to have social interactions. Without understanding each other's motives and intentions, and without taking into account what somebody else knows either about me or the environment, working together is at best difficult, at worst impossible.

If AI systems are indeed ever to walk among us, they'll have to be able to understand that each of us has thoughts and feelings and expectations for how we'll be treated. And they'll have to adjust their behavior accordingly.

Type IV AI: Self-awareness
The final step of AI development is to build systems that can form representations about themselves. Ultimately, we AI researchers will have to not only understand consciousness, but build machines that have it.

This is, in a sense, an extension of the "theory of mind" possessed by Type III artificial intelligences. Consciousness is also called "self-awareness" for a reason. ("I want that item" is a very different statement from "I know I want that item.") Conscious beings are aware of themselves, know about their internal states, and are able to predict feelings of others. We assume someone honking behind us in traffic is angry or impatient, because that's how we feel when we honk at others. Without a theory of mind, we could not make those sorts of inferences.

While we are probably far from creating machines that are self-aware, we should focus our efforts toward understanding memory, learning and the ability to base decisions on past experiences. This is an important step to understand human intelligence on its own. And it is crucial if we want to design or evolve machines that are more than exceptional at classifying what they see in front of them.

REPUBLISHED SOURCE

Arend Hintze Assistant Professor of Integrative Biology & Computer Science and Engineering, Michigan State University

Article was originally published on The Conversation.

GET YOUR TECHNOVA MERCHANDISE!

NAVY

Everest Insulated Softshell :: $90

Classically styled, insulated softshell jacket with functional water-repellant finish features elastic drawcord at hem with interior cordlocks for protection against the elements.

OCEAN BLUE

Himalaya Softshell :: $74

The Himalaya is a comfortable lightweight jacket ideal against the elements. Its durable water repellent finish, interior storm flap with a chin guard, and cuffs with Velcro closure will be sure to keep you comfortable.

NAVY

Alpina Knit Vest :: $29

Classic knit vest features exposed coil zipper with contrast stitch and reversed coil zipper on lower welt pockets - all with dark silver slider and easy-grip logo zipper pull. Handy elastic drawcord at hem with interior cordlocks for a custom fit.

LIGHT BLUE

Manhattan Oxford Shirt :: $35

This classic long-sleeve shirt with button-down collar is tailored with a pearlized button placket and features an upper patch pocket and left chest pocket with hidden utility loops. Double pleats at upper back for a looser fit.

OCEAN BLUE

New Yorker Golf Shirt :: $31

Men's version features three-button placket. Women's version with five-button placket features shaped seams for flattering fit. V-notch side slits.

RED

Roots Ball Cap :: $12

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Allow 10-14 days for delivery.

Nova Scotia and British Columbia Technology Associations Announce New Partnership

Investing in the tools needed to enhance the assessment of foreign credentials is the focus of important work currently underway between TechNova and the Applied Science Technologists and Technicians of British Columbia (ASTTBC).

The beneficiaries of this new joint initiative are foreign trained technology professionals looking to immigrate to one of the two provinces. This new collaboration will allow internationally trained technology professionals to have their credentials assessed at the pre-arrival stage and to apply for certification.

ASTTBC CEO John Leech and TechNova leadership met in Halifax to work through details of the new partnership on December 13, 2016. "We were able build on our agreement and put in place the framework for roll out of the program," said Leech. "This collaboration will greatly aid our investment in software, web site, and other resources without duplication of effort. I am pleased with the outcomes so far."

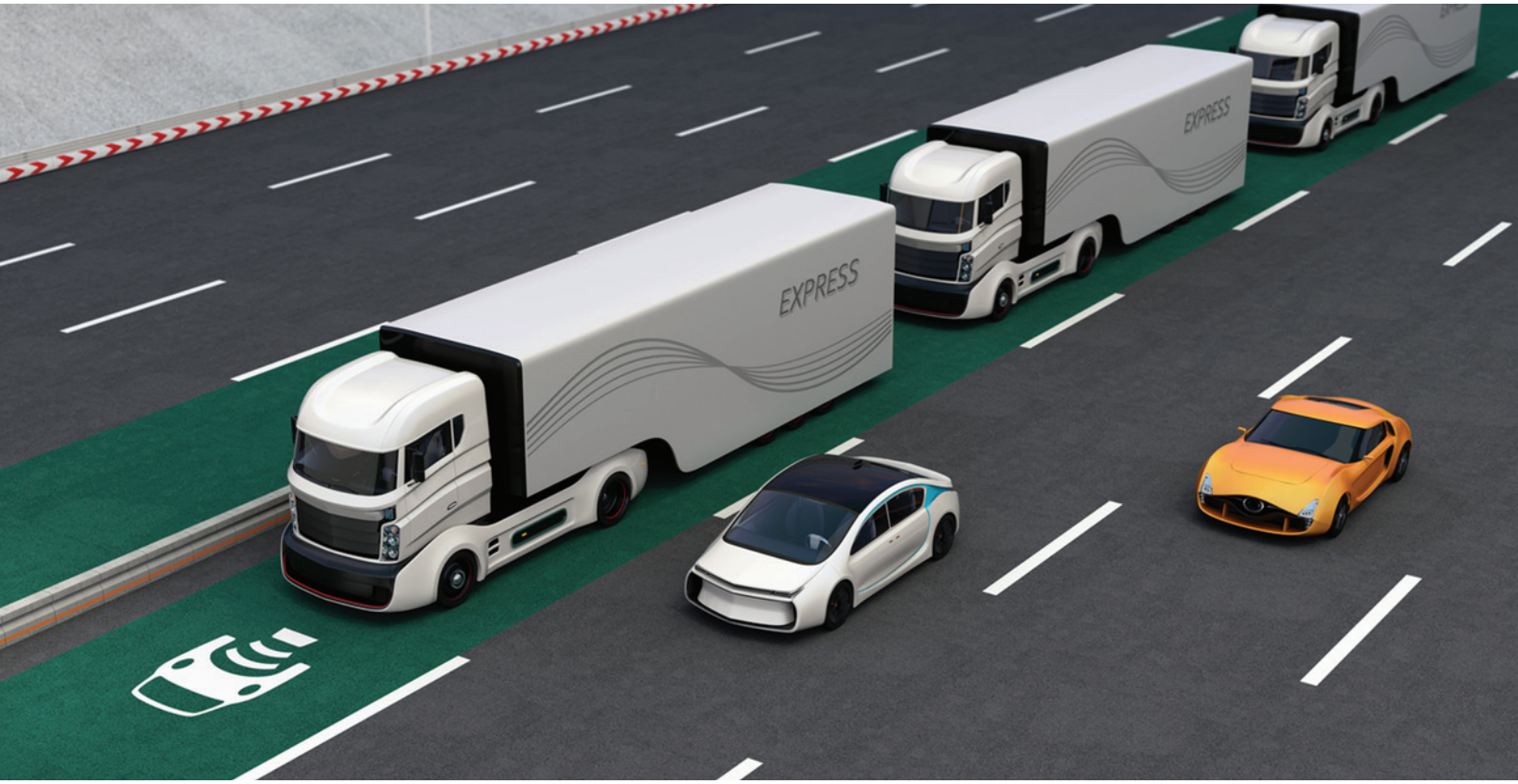
According to TechNova Executive Director Joe Sims the new partnership will enable both associations to leverage each others capabilities, tools and resources to enhance foreign credential recognition.

"With growing numbers of technology professionals coming to Canada each year our ability to advance credential recognition and certification is critical to maintaining Canada's skills inventory" said Sims.

On the photo
Nova Scotia and British Columbia association leaders and NS government representation gathered in Halifax to frame the implementation plan building on a signed Memorandum of Agreement between the two provincial associations.

Pictured are (L to R):
Rick Tachuk, national support to TechNova; Joe Simms, Executive Director, TechNova; Sean Piercey, program manager, TechNova; ASTTBC CEO John Leech; TechNova President Mark Bamford; and Louis Lebel from TechNova who leads the NS initiative with the provincial government.

The Future is Here: The Electric Highway!



It was Tesla Motors, more than any other company, that triggered the current interest in electric cars. The firm's namesake, Nikola Tesla, a genius inventor and Thomas Edison's arch rival, would no doubt be pleased. Yet Tesla would be even more thrilled to realise the next step for electric vehicles involves turning his biggest vision into reality: the wireless transmission of power.

Due to their low local emissions, battery-powered electric cars are more in demand than ever, but they still have a reputation for being too expensive and having too short a driving range. So how about recharging them without having to plug in a cable, while parking or even driving on the road?

This isn't science fiction: we know from our electric tooth brushes that batteries can be recharged without plugging in a wire, and even smart phones can be charged just by being placed on top of a pad.

Here's how it works: an alternating current (AC) flows through a wire coil (the transmitter), which causes a magnetic field to switch between two directions at

a high frequency. A second coil (the receiver) exposed to that magnetic fields picks up those oscillations, inducing an AC current in its own circuit, which is then used to power the car (or charges the battery in your toothbrush).

Electronic systems able to handle higher frequencies, which allow more power to be transmitted, are becoming more affordable. Energy can now be transferred between coils that are increasingly further apart or aren't aligned accurately.

Thanks to this technology, some electric cars can already be charged by parking them on top of charging pads, which can be as much as 20cm away from the receiving coil at the bottom of the vehicle. The next step is to wire-up the roads themselves with coils so that cars, buses, and even trucks could be charged while they move.

For peace of mind, wireless charging systems are properly shielded so that no animals or humans will be harmed. A coil in the road will only emit power when it is in wireless communication with a receiver coil above it, and the latter will absorb nearly all of it. The bit that is lost is mostly absorbed by the metal body of the car itself.

The path to wired-up roads

Retrofitting roads with wireless charging coils sounds expensive. But recent studies show that the biggest part of the cost comes from the construction work itself – on a new or renovated road, the extra costs are not that high.

Charging on the move isn't just a convenient time-saver – it will also bring down the cost of electric vehicles themselves. Batteries that get recharged more frequently during usage will last longer and can be made smaller while retaining the same driving range.

As with all new technologies that rely on not-yet existing infrastructure, wireless vehicle charging will start in a niche market (remember the early and expensive days of mobile phones?). In this case, the niche is electric buses that re-charge at bus stops and on certain segments of their fixed driving route.

The global pioneer is the Online Electric Vehicle (OLEV), a bus developed a few years ago by South Korea's Advanced Institute of Science and Technology (KAIST). Continuous charging means OLEV buses cover their routes using small batteries just a third the size of those found in a regular electric car. More recently, Swedish truck and bus-maker Scania trialled a similar system of recharging stations for buses to demonstrate such technology could still work in harsh Nordic winters.

For passenger cars, wireless charging will first come as a convenience feature. People will be able to park in their driveway or garage without having to plug in a cable, and will still have a recharged battery next time they need the car.

We will have to wait longer for a dense network of highways that can charge vehicles on the move. This would be a major infrastructure investment and would involve a substantial quest for more copper wires and semiconductor components.

Experience with the technology and agreement on international compatibility standards will be prerequisites of such investments. Safety must not be ignored: the transmitter coils emit substantial power, which is only considered safe if it is in proper communication with a receiver coil. Communication between transmitter and receiver must also be secured against accidental or even intentional interference – an aspect that even touches on cyber security.

So when and where will we see electrified roads being rolled out on larger scale? Korea will try and maintain its leadership in this technology. Places like Singapore, wealthy and with strong ambitions in clean and efficient transport, may follow soon. Standardised electrified roads could become what the railways were to the 19th century: not only a leap in transport efficiency, but the core of a new industry.

REPUBLISHED SOURCE

Harry Hoster, Director of Energy Lancaster and Professor of Physical Chemistry, Lancaster University. Originally published on The Conversation

NASA telescope reveals largest batch of Earth-size, habitable-zone planets around single star

NASA's Spitzer Space Telescope has revealed a new exoplanet discovery: the first known system of seven Earth-size planets around a single star. Three of these planets are firmly located in the habitable zone, the area around the parent star where a rocky planet is most likely to have liquid water.

The discovery sets a new record for greatest number of habitable-zone planets found around a single star outside our solar system. All of these seven planets could have liquid water–key to life as we know it–under the right atmospheric conditions, but the chances are highest with the three in the habitable zone.

"This discovery could be a significant piece in the puzzle of finding habitable environments, places that are conducive to life," said Thomas Zurbuchen, associate administrator of the agency's Science Mission Directorate in Washington. "Answering the question 'are we alone' is a top science priority and finding so many planets like these for the first time in the habitable zone is a remarkable step forward toward that goal."

At about 40 light-years (235 trillion miles) from Earth, the system of planets is relatively close to us, in the constellation Aquarius. Because they are located outside of our solar system, these planets are scientifically known as exoplanets.

This exoplanet system is called TRAPPIST-1, named for The Transiting Planets and Planetesimals Small Telescope (TRAPPIST) in Chile. In May 2016, researchers using TRAPPIST announced they had discovered three planets in the system. Assisted by several ground-based telescopes, including the European Southern Observatory's Very Large Telescope, Spitzer confirmed

the existence of two of these planets and discovered five additional ones, increasing the number of known planets in the system to seven.

The new results were published Wednesday in the journal Nature, and announced at a news briefing at NASA Headquarters in Washington.

Using Spitzer data, the team precisely measured the sizes of the seven planets and developed first estimates of the masses of six of them, allowing their density to be estimated.

Based on their densities, all of the TRAPPIST-1 planets are likely to be rocky. Further observations will not only help determine whether they are rich in water, but also possibly reveal whether any could have liquid water on their surfaces. The mass of the seventh and farthest exoplanet has not yet been estimated–scientists believe it could be an icy, "snowball-like" world, but further observations are needed.

"The seven wonders of TRAPPIST-1 are the first Earth-size planets that have been found orbiting this kind of star," said Michael Gillon, lead author of the paper and the principal investigator of the TRAPPIST exoplanet survey at the University of Liege, Belgium. "It is also the best target yet for studying the atmospheres of potentially habitable, Earth-size worlds."

In contrast to our sun, the TRAPPIST-1 star–classified as an ultra-cool dwarf–is so cool that liquid water could survive on planets orbiting very close to it, closer than is possible on planets in our solar system. All seven of the TRAPPIST-1 planetary orbits are closer to their host star than Mercury is to our sun. The planets also are very close to each other. If a person were standing on one of the planet's surface, they could gaze up and potentially see geological features or clouds of neighboring worlds, which would sometimes appear larger than the moon in Earth's sky.

The planets may also be tidally locked to their star, which means the same side of the planet is always facing the star, therefore each side is either perpetual day or night. This could mean they have weather patterns totally unlike those on Earth, such as strong winds blowing from the day side to the night side, and extreme temperature changes.

Spitzer, an infrared telescope that trails Earth as it orbits the sun, was well-suited for studying TRAPPIST-1 because the star glows brightest in infrared light, whose wavelengths are longer than the eye can see. In the fall of 2016, Spitzer observed TRAPPIST-1 nearly continuously for 500 hours. Spitzer is uniquely positioned in its orbit to observe enough crossing–transits–of the planets in front of the host star to reveal the complex architecture of the system. Engineers optimized Spitzer's ability to observe transiting planets during Spitzer's "warm mission," which began after the spacecraft's coolant ran out as planned after the first five years of operations.

"This is the most exciting result I have seen in the 14 years of Spitzer operations," said Sean Carey, manager of NASA's Spitzer Science Center at Caltech/IPAC in Pasadena, California. "Spitzer will follow up in the fall to further refine our understanding of these planets so that the James Webb Space Telescope can follow up. More observations of the system are sure to reveal more secrets."

Following up on the Spitzer discovery, NASA's Hubble Space Telescope has initiated the screening of four of the planets, including the three inside the habitable zone. These observations aim at assessing the presence of puffy, hydrogen-dominated atmospheres, typical for gaseous worlds like Neptune, around these planets.

In May 2016, the Hubble team observed the two innermost planets, and found no evidence for such puffy atmospheres. This strengthened the case that the planets closest to the star are rocky in nature.

"The TRAPPIST-1 system provides one of the best opportunities in the next decade to study the atmospheres around Earth-size planets," said Nikole Lewis, co-leader of the Hubble study and astronomer at the Space Telescope Science Institute in Baltimore. NASA's planet-hunting Kepler space telescope also is studying the TRAPPIST-1 system, making measurements of the star's minuscule changes in brightness due to transiting planets. Operating as the K2 mission, the spacecraft's observations will allow astronomers to refine the properties of the known planets, as well as search for additional planets in the system. The K2 observations conclude in early March and will be made available on the public archive.

Spitzer, Hubble, and Kepler will help astronomers plan for follow-up studies using NASA's upcoming James Webb Space Telescope, launching in 2018. With much greater sensitivity, Webb will be able to detect the chemical fingerprints of water, methane, oxygen, ozone, and other components of a planet's atmosphere. Webb also will analyze planets' temperatures and surface pressures–key factors in assessing their habitability.

NASA's Jet Propulsion Laboratory in Pasadena, California, manages the Spitzer Space Telescope mission for NASA's Science Mission Directorate. Science operations are conducted at the Spitzer Science Center, at Caltech, Pasadena, California. Spacecraft operations are based at Lockheed Martin Space Systems Company, Littleton, Colorado. Data are archived at the Infrared Science Archive housed at Caltech/IPAC. Caltech manages JPL for NASA.

REPUBLISHED SOURCE

Article and photo illustration compliments of NASA.

https://exoplanets.nasa.gov/news/1419/nasa-telescope-reveals-largest-batch-of-earth-size-habitable-zone-planets-around-single-star/

Registrar's Report 2017

Our present membership is on track with 2015. Presently it is made up of the following:

Status Type	2016	2015
Active Certified Members	1218	1237
Associate Members	39	31
Life Members	33	30
Non-Active	48	43
Pending	7	39
Retired	11	11
Retired Plus	32	31
Student	69	209
Total Members	**1457**	**1631**

Designation	Members
Applications Pending	7
Applied Science Technicians	4
Applied Science Technologist	13
Associate Technician	22
Associate Technologist	15
Certified Engineering Technicians	436
Certified Engineering Technologist	885
Student	69
International (Files opened)	40

In 2016 a total of 108 applicants were reviewed by the Board. As a result, 71 new members were added to the Register, compared to (72) in 2015.

A total of 1340 membership invoices were mailed, and to date approximately 212 members have not paid their membership fees for 2017. A second invoice with regular membership rate plus late filing fees was mailed on February 28th.

This letter also states that if their membership is not brought up to date they are required to return their certificate(s) at which time they will be struck from the register.
For the year ending December 31, 2016, (5) members were transferred out of the province and (12) members were transferred into TechNova.

We have seen a significant increase in the number of foreign inquiries over the past year. With the cancelling of the IQR project from CCTT, we now conduct a preliminary review of all inquiries for potential membership. With the debut of the newly developed IQA (International Qualification Assessment) program the initial reviews can be completed in a timely manner.

Presently the Certification Board Policy states the following, "At the time an initial application for membership is submitted, each applicant shall be a resident of Canada and shall provide proof of Canadian citizenship or landed immigrant status upon request."

This Policy in particular will be reviewed to determine if changes can be implemented in order to improve the certification process.

Thank you

Joseph Simms, CET

TehcNova President's Award

Starting with the new school year 2017/2018 TechNova will be introducing the TECHNOVA PRESIDENT'S AWARD, a new bursary for students in their final year of study in an accredited program.

The existing TechNova student bursaries are limited to students whose parents are members of TechNova, but this new award is open to all students who meet the criteria.

CTAB elects new Chair

During the recent annual meeting of the Canadian Technology Accreditation Board in Charlottetown, PEI, Candace Scott, CET, was elected as Chair.

Candace Scott, CET, has a civil engineering technology background and is currently a facilities manager with the New Brunswick government.

The Canadian Technology Accreditation Board is delighted to have Candace take over as chair for her two-year term.
Photo (left to right, back to front): Bryan Burt, Tom Sutton, Gordon Griffith, Ed Mercer, Nancy Wheatley, Cathy Cardy, Candace Scott and Joy Brown.

GREAT IDEA

Musk Says Tesla's Solar Shingles Will Cost Less Than A Dumb Roof

"ELECTRICITY IS JUST A BONUS."

It's official: After Tesla shareholders approved the acquisition of SolarCity, the new company is now an unequivocal sun-to-vehicle energy firm. And Chief Executive Officer Elon Musk didn't take long to make his first big announcement as head of this new enterprise.

Minutes after shareholders approved the deal—about 85 percent of them voted yes—Musk told the crowd that he had just returned from a meeting with his new solar engineering team. Tesla's new solar roof product, he proclaimed, will actually cost less to manufacture and install than a traditional roof—even before savings from the power bill. "Electricity," Musk said, "is just a bonus."

If Musk's claims prove true, this could be a real turning point in the evolution of solar power. The rooftop shingles he unveiled just a few weeks ago are something to behold: They're made of textured glass and are virtually indistinguishable from high-end roofing products. They also transform light into power for your home and your electric car.

"So the basic proposition will be: Would you like a roof that looks better than a normal roof, lasts twice as long, costs less and—by the way—generates electricity?" Musk said. "Why would you get anything else?"

Make no mistake: The new shingles will still be a premium product, at least when they first roll out. The terra cotta and slate roofs Tesla mimicked are among the most expensive roofing materials on the market—costing as much as 20 times more than cheap asphalt shingles.

Much of the cost savings Musk is anticipating comes from shipping the materials. Traditional roofing materials are brittle, heavy, and bulky. Shipping costs are high, as is the quantity lost to breakage. The new tempered-glass roof tiles, engineered in Tesla's new automotive and solar glass division, weigh as little as a fifth of current products and are considerably easier to ship, Musk said.

When Musk first unveiled the tiles on Oct. 28, the pricing details were murkier. He said that someone who buys a Tesla roof when the product is released next summer will save money compared with someone who buys a comparable traditional roof, plus electricity from the grid. But on a large house over a long period of time, the value of that electricity could exceed $100,000. The new target he unveiled today is considerably cheaper, and it's considerably more promising for the future of rooftop solar power.

REPUBLISHED SOURCE

https://www.bloomberg.com
Photography compliments of Tesla

did you know?

RENEW YOUR MEMBERSHIP ONLINE IN 4 EASY STEPS

You no longer have to wait for your renewal statement to arrive in the mail. The convenience of renewing your membership online is here.

To renew online you will need:

- Your credit card.

To renew online, follow these 4 easy steps:

1. Go to TechNova website (www.technova.ca).
2. On the homepage, click on the link to pay online.
3. Select your membership type from the menu.
4. Next, follow the online instructions.

If you have questions or require assistance, please call toll free: **1-866-723-8867**

CCTT news

CCTT ON-LINE JOB BOARD NOW AVAILABLE

CCTT is pleased to announce that it has launched a NEW job posting online service. This service may be used by CCTT partners and its goal is to bring job seekers and employers in the technology field together.

The portal is divided into three main categories: Industry Jobs, Academic Jobs and Government Jobs. Interested candidates seeking employment may view listings and obtain information on job opportunities at no charge.

To access the service visit www.cctt.ca and click on the CCTT Jobs button on the home page, or go directly to http://jobs.cctt.ca.

association news

MELOCHE MONNEX CONTINUING EDUCATION BURSARY*

The Meloche Monnex Continuing Education Bursary awards $1000 (actually two awards of $500.00 each) to a member, or child of a member, who is enrolled in a recognized technology program at the post-secondary level. The winner is selected at random from all eligible applicants. 1st of October. Entries must include proof of enrollment.

2016 Receipient : Paige Kourtney Power

RAY FISKE EDUCATION AWARD*

Named in honour of long-time Registrar Mr. Ray Fiske, P.Eng., CET (Hon.), TechNova awards a $500 bursary each year to the son or daughter of a member who is undertaking post-secondary studies.

The winner is drawn at random from all qualified applicants. The deadline for entries is 1st of October.

2016 Receipient: Paige Kourtney Power

AWARDS & BURSARIES

Provincial Awards & Bursaries

- President's Awarrd
- The Ray Fiske Memorial Award for Service Excellence
- Meloche Monnex Continuing Education Bursary
- Ray Fiske Education Award
- Student Achievement Awards

National Awards & Bursaries

- National Achievement Award
- Manulife Scholarship
- Canadian Technology Scholarship

** To apply, simply send a letter along with the name of your son or daughter and proof of his/her enrollment at a college or university. See our website (www.technova.ca) for more information.*

TechNova Certified Technology Professionals

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Tel: (902) 463-3236 Fax: (902) 465-7567 Toll Free: 1 866 723-8867
info@technova.ca www.technova.ca

ADVERTISING GUIDELINES 2017-2018

advertising rates

	1x	2x → 20% discount for 2 issues
Back Cover	$1750	$2800
2-Page Spread	$1500	$2400
Inside Front Cover	$1100	$1760
Inside Back Cover	$1100	$1760
Full Page	$800	$1280
1/2 Page	$400	$640
1/4 Page	$250	$400

NEW **Submit an article relevant to our industry and receive a 5% discount on all advertising**

MECHANICAL SPECIFICATIONS

Digital File Requirements

- All ads must be supplied as PDF/X 1a (press optimized, fonts embedded, Acrobat distiller), converted to CMYK.
- Ensure that all images are a minimum of 300ppi at 100% of final placement size.
- Text type should be a minimum of 8 point; reverse type minimum 12 point. Leadership In Technology and its suppliers are not responsible for reproduction of type sizes smaller than those mentioned.
- Convert all spot/special colours to four colour process. Please provide CMYK files only. Do not submit files in RGB.
- Ads may be supplied on CD or DVD, or uploaded onto our FTP, and must be accompanied by a colour proof.
- All proofs must be made from the original file and include trim, cropmarks, and bleed (0.125"), if required.
- Filenames for PDFs should consist of: advertiser name_ad size_issue date (example: Gallery_1/4pgH_summer11).
- Advertisers and/or advertising agencies assume full responsibility for all contents of advertisements and any claim made against Leadership In Technology because of such content.
- Supplied colour proofs are only an approximation of colour reproduction. Leadership In Technology and its suppliers aim for pleasing colour throughout the proofing/printing process.

advertising sizes

1 —Spread

Bleed	17.25" x 11.25"
Bleed Trim	17" x 11"
Non-Bleed	N/A

2 —Full Page/Cover

Bleed	8.75" x 11.25"
Bleed Trim	8.5" x 11"
Non-Bleed	7.5" x 10"

3 —1/2 PageVertical

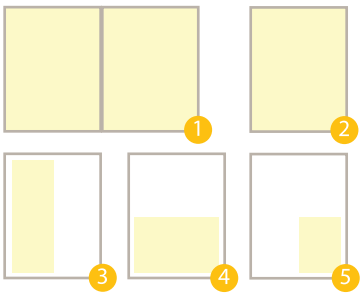
Bleed	4.4375" x 11.25"
Bleed Trim	4.1875" x 11"
Non-Bleed	3.6875" x 10"

4 —1/2 Page Horizontal

Bleed	8.75" x 5.6875"
Bleed Trim	8.5" x 5.4375"
Non-Bleed	7.5" x 4.9375"

5 —1/4 Page

Bleed	N/A
Bleed Trim	N/A
Non-Bleed	3.6875" x 4.9375"



Keep safety 3/8" from bleed, 1/4" from trim.

Publication trim size: 8.5" x 11"

PUBLICATION DATES

SPRING/SUMMER EDITION
Deadline: April 1, 2017
Delivery: July 10, 2017

FALL/WINTER EDITION
Deadline: October 15, 2017
Delivery: December 15, 2017

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