

The July 20th, 2016 Edition of THE REVENGE OF HUMP DAY!

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Welcome to the July 20th, 2016 Edition of THE REVENGE OF HUMP DAY!

The last week I have still been catching up on paperwork from LibertyCon 29 and now LibertyCon 30. This has been the most interesting experience for me because we have already had around 375 people preregistered for LibertyCon 30. The most interesting thing about those who have preregistered is that they are new people from all over the country. What is going on? Evidently a bunch of you are talking about how much you had at LibertyCon 29 and the word is getting around all over the country. I can understand that. But honestly, we still have almost a year to go for the next one and we have already sold half of the memberships. Thirty years ago when I started this beast, I never knew what we had wrought. But, I can be proud that Brandy and her posse are keeping the faith and doing a great job. And I am.

I have been watching the Republican National Convention and I have found it to be interesting. Rudy Giuliani delivered a stem winder of a speech that really got the crowd wound up. But Melania Trump did a hell of a job talking about her husband. You know, that is a classy and beautiful lady. Donald is a lucky guy in more ways than one.

On another note, we are in the middle of a heat wave in East Tennessee and it is miserable outside. But it just goes to show that Southerners are God's Chosen People. You don't believe me? I can prove it. God especially loves us because he invented air conditioning and if we didn't have it, we couldn't live here during the summer. ;^)

Tomorrow is a very special day for the Bolgeo Clan. July 20, 2016 is Tristan James Giovanni "Bubba Bear" Bolgeo's 6th birthday. I can see cake and ice cream in our future tomorrow. Yesterday, Bubba Bear brought his new bicycle over to ride it in the driveway and to show Big Papa and Nana his spoils. Things like this are what makes living worth it.

So on that "Happy Note", why don't y'all sit back and relax because here's the best in gossip, jokes and science for your reading pleasure!

Uncle Timmy

<G>~<O>~<S>~<S>~<I>~<P>~<S>~<T>~<A>~<R>~<T>~<S>~<H>~<E>~<R>~<E>~<I>

GRAND ADMIRAL THRAWN JOINS REBELS AND THE NEW STAR WARS CANON

From: Rob Bricken, Saturday 11:40am

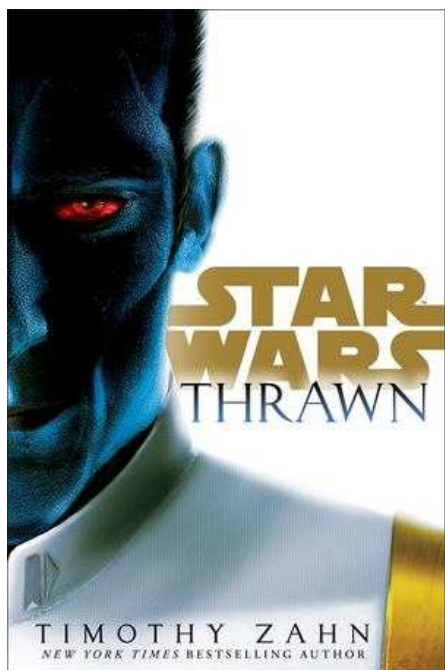
<http://io9.gizmodo.com/grand-admiral-thrawn-joins-rebels-and-the-new-star-wars-1783779089>

Holy crap. Rebels has a new Big Bad, and it's an old Big Bad—Grand Admiral Thrawn, the brilliant Imperial military commander who took over the remnants of the Empire in the old Expanded Universe, as revealed in the very first EU novel trilogy by Timothy Zahn.

Some things to note: 1) He's definitely referred to as "Grand Admiral." 2) There's no mention of anything else from Heir to the Empire or the other two books of the trilogy, so don't go think those novels have suddenly been added wholesale to the new canon. 3) He's being voiced by Lars Mikkelsen, brother of Rogue One star Mads. 3) Timothy Zahn sent a video message giving his full approval. Nice!



Update: Zahn is writing a new Star Wars novel titled—wait for it—Thrawn, due 2017. This isn't just a cameo, guys.



From FaceBook's Star Wars Books

July 16

The waiting ends. Welcome back Timothy Zahn as he writes Star Wars Thrawn a new novel that features the return of Grand Admiral Thrawn who is also set to appear on Star WARS Rebels.

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MASSIVE BOOK SALE OF THE COLLECTION OF KLON NEWELL JULY 22 and 23, 9 am to 5 pm (Second notice)

From: "Jack Gonzalez" jgonzo001@gmail.com

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Klon Newell, retired Director of LibertyCon and Rare Book Dealer, is now in assisted living and doing well. We are planning a book sale at Klon's home on July 22 and 23, 9 am. to 5 pm. to help pay his expenses in the assisted living facility to benefit Klon. There will be almost 6,000 books to choose from at some very affordable prices.

Klon will there at the sale to shoot the breeze and say hello. His address is below and phone no. remains the same. Thanks for your help.

Klon Newell
305 Stoneland Drive
Athens, GA. 30606

I PLAN ON GOING DOWN THERE TO BUY A BUNCH OF BOOKS. I HOPE THAT I SEE A BUNCH OF Y'ALL DOWN THERE. UT

<L>~<I>~~<E>~<R>~<T>~<Y>~<C>~<O>~<N>

FROM A FRIEND WHO IS RETIRING

From: "Nancy Skidmore" Nancy.skidmore@gmail.com

I am mostly retiring from ARTC because of my health. I have Macular Degeneration, the dry kind, and I am allergic to the vitamins that slows the disease. I got a rude awakening at MomoCon when I could not read the Hugh directing signs at GWCC. I can longer read books that has been true for some time now but jeez those signs are big. I can use my phone for emails reasonable well. Using my computer on the other hand is a study in frustration and causes tears. So please use This email address or call me.

I will not be at Dragoncon we are now on fixed income plus it us just to big. LibertyCon will be our main convention for now.

It has been a great joy and learning experience working with ARTC. I wish you all STANDING OVATIONS and Sensational reviews.

I will always be around to give my opinion and advice when asked.

With all my love
Nancy

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Re: Finally finishing last week's Revenge...

From: "Jim Woosley" Jimwoosley@aol.com

Regarding the final item:

If the Second Amendment only covers muskets, and the First Amendment only covers printed broadsides on a Gutenberg press, then the Fourth Amendment only covers hand-

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written letters kept in a shoebox at home, and the Fifth Amendment doesn't apply anywhere other than in federal courts, and in particular doesn't apply to FBI depositions.

In other words, it's the logical extension of the other Anti-Constitutional abortions that the left (and progressive Republicans, who I count among the left) have foisted upon us...

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Re: LibertyCon 29

From: "Lin Daniel" lindaniel@usa.net

Hi Uncle Timmy

Thanks for reminding me. I just got my LC30 registration. They're going to sell out earlier than ever before.

I had a great time. I'm looking forward to slogging thru the thunderstorms (I drove thru Cincinnati to the sounds of rain pounding on my roof and Christopher Cross singing "Sailing" on the radio) to the heart of Tennessee. I don't know how anybody else feels, but my heart is there.

Hugs!! Lin Wombat's Otter

GREAT LADY! GOOD PEOPLE! UT

<T>~<H>~<E>~<J>~<O>~<K>~<E>~<S>~<S>~<T>~<A>~<R>~<T>~<H>~<E>~<R>~<E>

From: "RAY BELOATE" <beerman@rittermail.com>

Grin for Today!

An atheist was seated next to a little girl on an airplane and he turned to her and said, "Do you want to talk? Flights go quicker if you strike up a conversation with your fellow passenger."

The little girl, who had just started to read her book, replied to the total stranger, "What would you want to talk about?"

"Oh, I don't know," said the atheist. "How about why there is no God, or no Heaven or Hell, or no life after death?" as he smiled smugly.

"Okay," she said. "Those could be interesting topics but let me ask you a question first. A horse, a cow, and a deer all eat the same stuff - grass. Yet a deer excretes little pellets, while a cow turns out a flat patty, but a horse produces clumps. Why do you suppose that is?"

The atheist, visibly surprised by the little girl's intelligence, thinks about it and says, "Hmmm, I have no idea."

To which the little girl replies, "Do you really feel qualified to discuss God, Heaven and Hell, or life after death, when you don't know shit?"

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THE 5 MINUTE MANAGEMENT COURSE

Lesson 1:

A man is getting into the shower just as his wife is finishing up her shower, when the doorbell rings.

The wife quickly wraps herself in a towel and runs downstairs.

When she opens the door, there stands Bob, the next-door neighbor.

Before she says a word, Bob says, 'I'll give you \$800 to drop that towel.'

After thinking for a moment, the woman drops her towel and stands naked in front of Bob, after a few seconds, Bob hands her \$800 and leaves.

The woman wraps back up in the towel and goes back upstairs.

When she gets to the bathroom, her husband asks, 'Who was that?'

'It was Bob the next door neighbor,' she replies.

'Great,' the husband says, 'did he say anything about the \$800 he owes me?'

Moral of the story:

If you share critical information pertaining to credit and risk with your shareholders in time, you may be in a position to prevent avoidable exposure

Lesson 2:

A priest offered a Nun a lift.

She got in and crossed her legs, forcing her gown to reveal a leg.

The priest nearly had an accident.

After controlling the car, he stealthily slid his hand up her leg.

The nun said, 'Father, remember Psalm 129?'

The priest removed his hand. But, changing gears, he let his hand slide up her leg again.

The nun once again said, 'Father, remember Psalm 129?'

The priest apologized 'Sorry sister but the flesh is weak.'

Arriving at the convent, the nun sighed heavily and went on her way.

On his arrival at the church, the priest rushed to look up Psalm 129. It said, 'Go forth and seek, further up, you will find glory.'

Moral of the story:

If you are not well informed in your job, you might miss a great opportunity.

Lesson 3:

A sales rep, an administration clerk, and the manager are walking to lunch when they find an antique oil lamp.

They rub it and a Genie comes out.

The Genie says, 'I'll give each of you just one wish.'

'Me first! Me first!' says the admin clerk. 'I want to be in the Bahamas , driving a speedboat, without a care in the world.'

Puff! She's gone.

'Me next! Me next!' says the sales rep. 'I want to be in Hawaii , relaxing on the beach with my personal masseuse, an endless supply of Pina Coladas and the love of my life.'

Puff! He's gone.

'OK, you're up,' the Genie says to the manager.

The manager says, 'I want those two back in the office after lunch.'

Moral of the story:

Always let your boss have the first say.

Lesson 4

An eagle was sitting on a tree resting, doing nothing.

A small rabbit saw the eagle and asked him, 'Can I also sit like you and do nothing?' The eagle answered: 'Sure, why not.'

So, the rabbit sat on the ground below the eagle and rested. All of a sudden, a fox appeared, jumped on the rabbit and ate it.

Moral of the story:

To be sitting and doing nothing, you must be sitting very, very high up.

Lesson 5

A turkey was chatting with a bull.

'I would love to be able to get to the top of that tree' sighed the turkey, 'but I haven't got the energy.' 'Well, why don't you nibble on some of my droppings?' replied the bull. They're packed with nutrients.'

The turkey pecked at a lump of dung, and found it actually gave him enough strength to reach the lowest branch of the tree.

The next day, after eating some more dung, he reached the second branch.

Finally after a fourth night, the turkey was proudly perched at the top of the tree.

He was promptly spotted by a farmer, who shot him out of the tree.

Moral of the story:

Bull Shit might get you to the top, but it won't keep you there..

Lesson 6

A little bird was flying south for the winter. It was so cold the bird froze and fell to the ground into a large field.

While he was lying there, a cow came by and dropped some dung on him. As the frozen bird lay there in the pile of cow dung, he began to realize how warm he was. The dung was actually thawing him out!

He lay there all warm and happy, and soon began to sing for joy. A passing cat heard the bird singing and came to investigate.

Following the sound, the cat discovered the bird under the pile of cow dung, and promptly dug him out and ate him.

Morals of the story:

- (1) Not everyone who shits on you is your enemy.
- (2) Not everyone who gets you out of shit is your friend.
- (3) And when you're in deep shit, it's best to keep your mouth shut!

THUS ENDS THE FIVE MINUTE MANAGEMENT COURSE.

Send this to at least five bright, funny people you know and make their day!

<J>~<O>~<K>~<E>~<S>~<of>~<the>~<W>~<E>~<E>~<K>

From: "Mike Williamson" mzmadmike@gmail.com

QUAERITUR: Use of the beretta at Mass in the Ordinary Form

Posted on 27 September 2010 by Fr. John Zuhlsdorf

<http://wdtprs.com/blog/2010/09/quaeritur-use-of-the-beretta-at-mass-in-the-ordinary-form/>

From a reader:

Can a beretta be used in the OF? When would it be used?

Yes, without question! But make sure that it is clean and in good working order so that it doesn't misfire.

I would use the beretta primarily when there are too many extraordinary ministers charging the altar. Another possible moment would be when the choir sings On Eagles Wings or another ditty of that sort.

The best way to use the beretta is to rise... first removing your biretta – which is perfectly correct to use in celebrations of the Ordinary Form of the Roman Rite – and, taking aim, go for center Mass shots (NB: some recommend head shots – auctores scinduntur).

I have learned through hard won and tough experience that you should immediately reload!

To save you and everyone else that embarrassing hitching up of the alb and digging in the pocket for a magazine, have ready on a silver salver, prepared before Mass, covered with a linen cloth about the size of a corporal. The altar boy, or if it is a more solemn occasion, deacon, can bring you magazines as you should need them.

The beretta should be cleaned after the purification of the chalice and before the final prayer and dismissal.

The congregation will be quite patient and will, believe me, not leave before that final blessing.

[No actual extraordinary ministers of Communion or pop-combo members were hurt in the making of this blog entry.]

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AS A ROMAN CATHOLIC I CAN TELL YOU THAT THIS IS SICK. FUNNY AS HELL, BUT SICK. MIKE, YOU OUGHT TO BE ASHAMED OF YOURSELF FOR SENDING IT. AND I SHOULD BE ASHAMED OF MYSELF FOR PRINTING IT. BUT BY GOD, IT'S FUNNY. AND I CAN SEE MY OWN PRIEST WRITING THE LAST LINE OF THE MAIN BLOG ENTRY. "The congregation will be quite patient and will, believe me, not leave before that final blessing." UT

From MZW: Sick? I'm not the one who can't tell a Beretta from a Biretta.

<J>~<O>~<K>~<E>~<S>~<of>~<the>~<W>~<E>~<E>~<K>

From: "Keith A. Glass" salgak@comcast.net

A guy goes to the post office to apply for a job.

The interviewer asks him, "Are you allergic to anything?"

He replies, "Yes, caffeine. I can't drink coffee."

"Ok, Have you ever been in the military service?"

"Yes," he says, "I was in Iraq for one tour."

The interviewer says, "That will give you 5 extra points toward employment." Then he asks, "Are you disabled in any way?"

The guy says, "Yes. A bomb exploded near me and I lost both my testicles."

The interviewer grimaces and then says, "Okay. You've got enough points for me to hire you right now. Our normal hours are from 8:00 am to 4:00 pm. You can start tomorrow at 10:00 am, and plan on starting at 10:00 am every day."

The guy is puzzled and asks, "If the work hours are from 8:00 am to 4:00 PM, why don't you want me here until 10:00 am?"

"This is a government job", the interviewer says. "For the first two hours, we just stand around drinking coffee and scratching our balls. No point in you coming in for that."

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From: "Mike Waldrip" waldripk@gmail.com

ADMIRAL NELSON

Nelson: "Order the signal, Hardy."

Hardy: "Aye, aye sir."

Nelson: "Hold on, this isn't what I dictated to Flagg. What's the meaning of this?"

Hardy: "Sorry sir?"

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Nelson (reading aloud): "England expects every person to do his or her duty, regardless of race, gender, sexual orientation, religious persuasion or disability. 'What gobbledygook is this for God's sake?"

Hardy: "Admiralty policy, I'm afraid, sir. We're an equal opportunities employer now. We had the devil's own job getting 'England' past the censors, lest it be considered racist."

Nelson: "Gadzooks, Hardy. Hand me my pipe and tobacco."

Hardy: "Sorry sir. All naval vessels have now been designated smoke-free working environments."

Nelson: "In that case, break open the rum ration. Let us splice the main brace to steel the men before battle."

Hardy: "The rum ration has been abolished, Admiral. It's part of the Government's policy on binge drinking."

Nelson: "Good heavens, Hardy. I suppose we'd better get on with it, full speed ahead."

Hardy: "I think you'll find that there's a 4 knot speed limit in this stretch of water. It's an environment protection initiative."

Nelson: "Damn it man! We are on the eve of the greatest sea battle in history. We must advance with all dispatch. Report from the crow's nest, please."

Hardy: "That won't be possible, sir."

Nelson: "What?"

Hardy: "Health and Safety have closed the crow's nest, Sir. No harness; and they said that rope ladders don't meet regulations. They won't let anyone up there until proper scaffolding can be erected."

Nelson: "Then get me the ship's carpenter without delay, Hardy."

Hardy: "He's busy knocking up a wheelchair access to the foredeck Admiral."

Nelson: "Wheelchair access? I've never heard anything so absurd."

Hardy: "Anti-discrimination requirements, sir. We have to provide a barrier-free environment for the differently abled....."

Nelson: "Differently abled? I've only one arm and one eye and I refuse even to hear mention of the word. I didn't rise to the rank of Admiral by playing the disability card."

Hardy: "Actually, sir, you did. The Royal Navy is under-represented in the areas of visual impairment and limb deficiency."

Nelson: "Whatever next? Give me full sail. The salt spray beckons."

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Hardy: "A couple of problems there too, sir. Health and safety won't let the crew up the rigging without hard hats. And they don't want anyone breathing in too much salt; haven't you seen the adverts?"

Nelson: "I've never heard such infamy. Break out the cannon and tell the men to stand by to engage the enemy."

Hardy: "The men are a bit worried about shooting at anyone, Admiral."

Nelson: "What? This is mutiny!"

Hardy: "It's not that, sir. It's just that they're afraid of being charged with murder if they actually kill anyone. There are a couple of legal-aid lawyers on board, watching everyone like hawks."

Nelson: "Then how are we to sink the Frenchies and the Spanish?"

Hardy: "Actually, sir, we're not."

Nelson: "We're not?"

Hardy: "No, sir. The French and the Spanish are our European partners now. According to the Common Fisheries Policy, we shouldn't even be in this stretch of water. We could get hit with a claim for compensation."

Nelson: "But you must hate a Frenchman as you hate the devil."

Hardy: "I wouldn't let the ship's diversity coordinator hear you saying that sir. You'll be up on disciplinary report."

Nelson: "You must consider every man an enemy who speaks ill of your King."

Hardy: "Not any more, sir. We must be inclusive in this multicultural age. Now put on your Kevlar vest; it's the rules. It could save your life."

Nelson: "Don't tell me - health and safety again! Whatever happened to rum, sodomy and the lash?"

Hardy: ""As I explained, sir, rum is off the menu! And there's a ban on corporal punishment."

Nelson: "What about sodomy?"

Hardy: "I believe that is now legal, sir."

Nelson: "In that case. kiss me, Hardy."

<J>~<O>~<K>~<E>~<S>

TACKY ALERT: THE FOLLOWING DOGGEREL IS JUST PLAIN TACKY. FUNNY, BUT TACKY.

WHO WILL PAY THE PECKER CHECKER?

There are important questions to be answered about this bathroom legislation and transgenders being able to use a restroom of the gender that they "identify" with.

Will public restrooms be required to have a Genital Inspection Station posted at the entrance to all public restrooms?

Who will have to pay these Pecker Checkers the people using the restroom, or the entity that owns the restroom?

And how much money will a Pecker Checker be paid to check peckers?

Or, do we pay a Pecker Checker by the number of peckers checked by each Pecker Checker?

How many peckers can a Pecker Checker check if a Pecker Checker could check peckers?

What has this country come to when the U.S. Department of Labor has to create a new job description of Politically Correct Restroom Service Inspectors?

Want to guess their motto.....???

"If you gotta pee - We gotta see!"

<J>~<O>~<K>~<E>~<S>



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KFC AND THE POPE

During a Papal audience, a business man approached the Pope and made this offer: Change the last line of the Lord's prayer from "give us this day our daily bread" to "give us this day our daily chicken." and KFC will donate 10 million dollars to Catholic charities.

The Pope declined. 2 weeks later the man approached the Pope again. This time with a 50 million dollar offer. Again the Pope declined. A month later the man offers 100 million, this time the Pope accepts.

At a meeting of the Cardinals, The Pope announces his decision in the good news/bad news format. The good news is... that we have 100 million dollars for charities. The bad news is that we lost the Wonder Bread account!

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From: "Jim Woosley" Jimwoosley@aol.com

Thoughtless for the day

Would the wing muscles of a flying pig make bacon tougher? Or would the delicious pork buffalo wings compensate for the loss?

<J>~<O>~<K>~<E>~<S>~<of>~<the>~<W>~<E>~<E>~<K>

From: "Martin L King Jr" kingjr_martin@yahoo.com

The disgruntled supporters of Beanie, er make that Bernie, Sanders intend to raise a stink, er make that make same noise, er get attention at the Democratic Convention with a "Fart-In"! Really, no shit (at least we hope not).... Personally I hope this comes out like, er make that resembles the campfire scene in Blazing Saddles. It would be worth watching the convention to see Hilary's coif ruffled by really vagrant, er make that fragrant breezes while trying to give her acceptance speech.

Smell the Bern: Bernie Supporters Plan Fart-In at Democrat Convention

<https://www.thegatewaypundit.com/2016/07/smell-bern-bernie-supporters-plan-fart-democrat-convention/>

THAT WAS BAD MARTY. VERY BAAAAAADD DDDDDDDDD! UT

<YOU>~<>~<JUST>~<>~<CAN'T>~<>~<MAKE>~<>~<THIS>~<>~<STUFF>~<>~<UP!>

YOU JUST CAN'T MAKE THIS STUFF UP!

From: "Tim Bolgeo" tbolgeo@comcast.net

DEPUTY FIRES 'ONE-IN-A-BILLION' SHOT DOWN BARREL OF SUSPECT'S GUN

by AWR HAWKINS, 15 Jul 2016

<http://www.breitbart.com/big-government/2016/07/15/deputy-fires-one-in-a-billion-shot-down-barrel-of-suspects-gun/>



On July 13, Arapahoe County prosecutors released details on a January shooting in which a Colorado deputy opened fire during an attempted robbery and shot a bullet down the barrel of a suspect's pistol.

The shot is considered "one-in-a-billion."

According to the Aurora Sentinel, Deputy Jose Marquez was off duty and not in uniform when the incident occurred. He walked out of his girlfriend's apartment "to grab something from his car." On his way back inside, he was confronted by two men, one of whom, Jhalil Meshesha, pulled a gun and told Marquez to "give it up."

Marquez was armed, as well, and an exchange of gunfire occurred.

One of Marquez's bullets traveled down the barrel of Meshesha's gun, "disabling" it.

In the letter released July 13, Arapahoe County Deputy District Attorney Rich Orman said, "Deputy Marquez reasonably believed that his life was in danger and acted reasonably in

shooting Meshesha, and that he used an appropriate level of physical force. I further find that Deputy Marquez's actions were justified and he did not violate Colorado law."

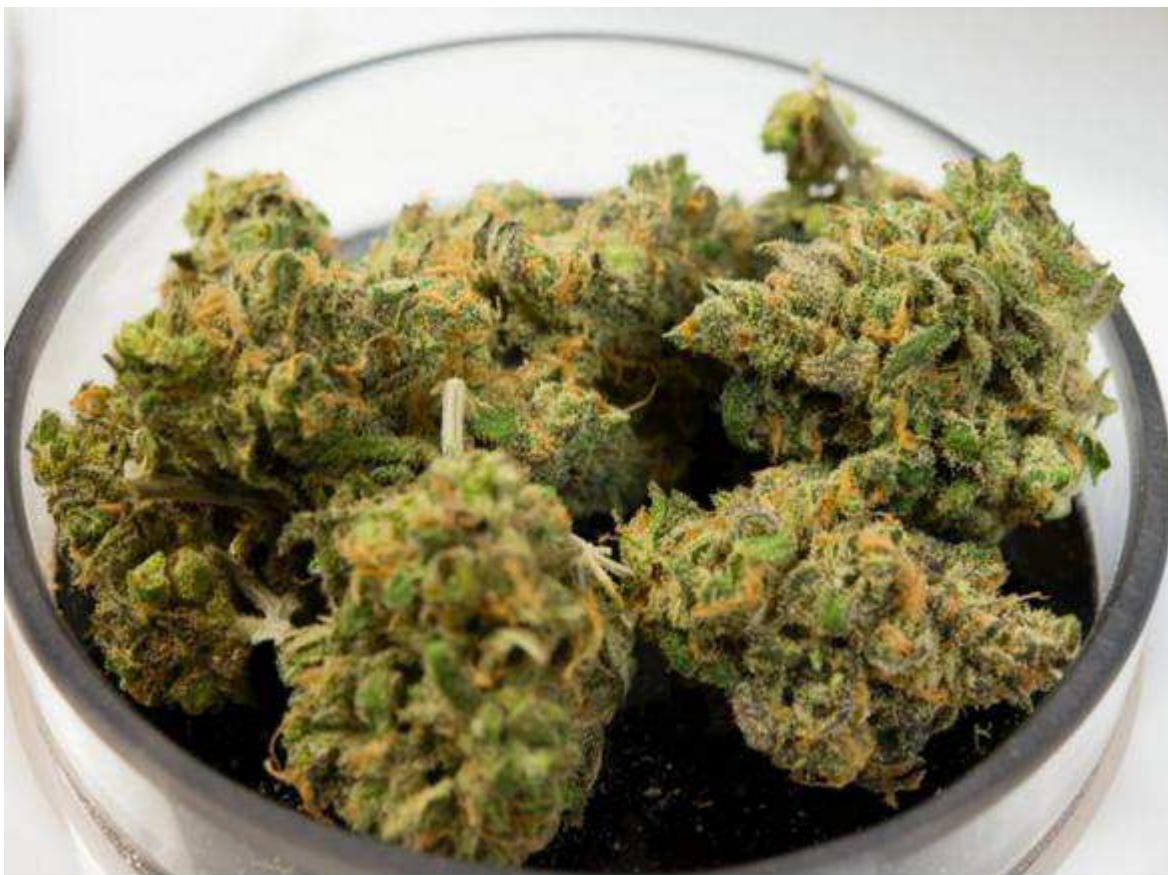
AWR Hawkins is the Second Amendment columnist for Breitbart News and political analyst for Armed American Radio. Follow him on Twitter: @AWRHawkins. Reach him directly at awrhawkins@breitbart.com.

<?>~<YOU JUST CAN'T MAKE THIS STUFF UP!>~<?>

ONE STRIKING CHART SHOWS WHY PHARMA COMPANIES ARE FIGHTING LEGAL MARIJUANA

By Christopher Ingraham July 13

https://www.washingtonpost.com/news/wonk/wp/2016/07/13/one-striking-chart-shows-why-pharma-companies-are-fighting-legal-marijuana/?utm_medium=email&utm_source=nextdraft



(Sarah L. Voisin/The Washington Post)

There's a body of research showing that painkiller abuse and overdose are lower in states with medical marijuana laws. These studies have generally assumed that when medical marijuana is available, pain patients are increasingly choosing pot over powerful and deadly prescription narcotics. But that's always been just an assumption.

Now a new study, released in the journal *Health Affairs*, validates these findings by providing clear evidence of a missing link in the causal chain running from medical

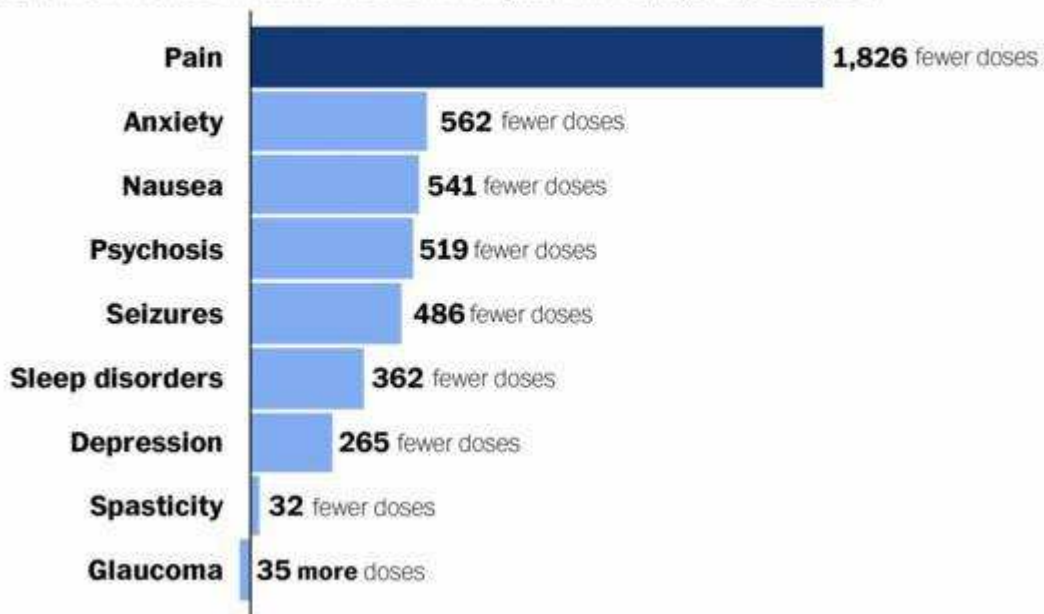
marijuana to falling overdoses. Ashley and W. David Bradford, a daughter-father pair of researchers at the University of Georgia, scoured the database of all prescription drugs paid for under Medicare Part D from 2010 to 2013.

They found that, in the 17 states with a medical-marijuana law in place by 2013, prescriptions for painkillers and other classes of drugs fell sharply compared with states that did not have a medical-marijuana law. The drops were quite significant: In medical-marijuana states, the average doctor prescribed 265 fewer doses of antidepressants each year, 486 fewer doses of seizure medication, 541 fewer anti-nausea doses and 562 fewer doses of anti-anxiety medication.

But most strikingly, the typical physician in a medical-marijuana state prescribed 1,826 fewer doses of painkillers in a given year.

Fewer pills prescribed in medical pot states

Difference between annual drug doses prescribed per physician in medical marijuana states, and in states without medical marijuana laws, by drug category



WAPO.ST/Workblog Source: Bradford & Bradford, Health Affairs, July 2016

These conditions are among those for which medical marijuana is most often approved under state laws. So as a sanity check, the Bradfords ran a similar analysis on drug categories that pot typically is not recommended for — blood thinners, anti-viral drugs and antibiotics. And on those drugs, they found no changes in prescribing patterns after the passage of marijuana laws.

"This provides strong evidence that the observed shifts in prescribing patterns were in fact due to the passage of the medical marijuana laws," they write.

In a news release, lead author Ashley Bradford wrote, "The results suggest people are really using marijuana as medicine and not just using it for recreational purposes."

One interesting wrinkle in the data is glaucoma, for which there was a small increase in demand for traditional drugs in medical-marijuana states. It's routinely listed as an approved condition under medical-marijuana laws, and studies have shown that marijuana provides some degree of temporary relief for its symptoms.

The Bradfords hypothesize that the short duration of the glaucoma relief provided by marijuana — roughly an hour or so — may actually stimulate more demand in traditional glaucoma medications. Glaucoma patients may experience some short-term relief from marijuana, which may prompt them to seek other, robust treatment options from their doctors.

The tanking numbers for painkiller prescriptions in medical marijuana states are likely to cause some concern among pharmaceutical companies. These companies have long been at the forefront of opposition to marijuana reform, funding research by anti-pot academics and funneling dollars to groups, such as the Community Anti-Drug Coalitions of America, that oppose marijuana legalization.

Pharmaceutical companies have also lobbied federal agencies directly to prevent the liberalization of marijuana laws. In one case, recently uncovered by the office of Sen. Kirsten Gillibrand (D-N.Y.), the Department of Health and Human Services recommended that naturally derived THC, the main psychoactive component of marijuana, be moved from Schedule 1 to Schedule 3 of the Controlled Substances Act — a less restrictive category that would acknowledge the drug's medical use and make it easier to research and prescribe. Several months after HHS submitted its recommendation, at least one drug company that manufactures a synthetic version of THC — which would presumably have to compete with any natural derivatives — wrote to the Drug Enforcement Administration to express opposition to rescheduling natural THC, citing "the abuse potential in terms of the need to grow and cultivate substantial crops of marijuana in the United States."

The DEA ultimately rejected the HHS recommendation without explanation.

In what may be the most concerning finding for the pharmaceutical industry, the Bradfords took their analysis a step further by estimating the cost savings to Medicare from the decreased prescribing. They found that about \$165 million was saved in the 17 medical marijuana states in 2013. In a back-of-the-envelope calculation, the estimated annual Medicare prescription savings would be nearly half a billion dollars if all 50 states were to implement similar programs.

"That amount would have represented just under 0.5 percent of all Medicare Part D spending in 2013," they calculate.

Cost-savings alone are not a sufficient justification for implementing a medical-marijuana program. The bottom line is better health, and the Bradfords' research shows promising evidence that medical-marijuana users are finding plant-based relief for conditions that otherwise would have required a pill to treat.

"Our findings and existing clinical literature imply that patients respond to medical marijuana legislation as if there are clinical benefits to the drug, which adds to the

growing body of evidence suggesting that the Schedule 1 status of marijuana is outdated," the study concludes.

One limitation of the study is that it only looks at Medicare Part D spending, which applies only to seniors. Previous studies have shown that seniors are among the most reluctant medical-marijuana users, so the net effect of medical marijuana for all prescription patients may be even greater.

The Bradfords will next look at whether similar patterns hold for Medicaid.

<YOU>~<>~<JUST>~<>~<CAN'T>~<>~<MAKE>~<>~<THIS>~<>~<STUFF>~<>~<UP!>

YOU JUST CAN'T MAKE THIS STUFF UP!

From: "Mike Williamson" mzmadmike@gmail.com

HEAVY MELLOW

<https://www.youtube.com/watch?v=FW3KsmFqIPg>

This is amazing. Iron Maiden Heavy metal done flamenco style. You can hear the classical styles the rock tunes were based on.

<?>~<YOU JUST CAN'T MAKE THIS STUFF UP!>~<?>

TODAY'S SIGN OF THE APOCALYPSE

Arlington Cemetery, Jul 12, 2016, 4:15 PM

Arlington Cemetery @ArlingtonNatl

<https://mobile.twitter.com/ArlingtonNatl/status/752959640816582656>

We do not consider playing "Pokemon Go" to be appropriate decorum on the grounds of ANC. We ask all visitors to refrain from such activity.

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From: "Tim Bolgeo" tbolgeo@comcast.net

WORLD'S LARGEST STORAGE BATTERY WILL POWER LOS ANGELES

More than 18,000 lithium ion battery packs would replace a gas-fired power plant used to meet peak demand

By John Fialka, ClimateWire on July 7, 2016

http://www.scientificamerican.com/article/world-s-largest-storage-battery-will-power-los-angeles/?WT.mc_id=SA_ENGYSUS_20160714

By 2021, electricity use in the west Los Angeles area may be in for a climate change-fighting evolution.

For many years, the tradition has been that on midsummer afternoons, engineers will turn on what they call a “peaker,” a natural gas-burning power plant in Long Beach. It is needed to help the area’s other power plants meet the day’s peak electricity consumption. Thus, as air conditioners max out and people arriving home from work turn on their televisions and other appliances, the juice will be there.

Five years from now, if current plans work out, the “peaker” will be gone, replaced by the world’s largest storage battery, capable of holding and delivering over 100 megawatts of power an hour for four hours. The customary afternoon peak will still be there, but the battery will be able to handle it without the need for more fossil fuels. It will have spent the morning charging up with cheap solar power that might have otherwise been wasted.

Early the next morning, the battery will be ready for a second peak that happens when people want hot water and, again, turn on their appliances. It has spent the night sucking up cheap power, most of it from wind turbines.

The politics for this to happen are now in place because California’s Public Utilities Commission set a target requiring utilities to build their capacity to store energy, to use more renewable energy and to cut the state’s greenhouse gas emissions 80 percent by 2050. The economics are there, too, because the local utility, Southern California Edison Co., picked the designer of the battery, AES Corp., an Arlington, Va., company, against 1,800 other offers to replace the peaker.

It was the first time an energy storage device had won a competition against a conventional power plant.

And the technology seems mature. AES has spent nine years working with manufacturers of electric-car batteries. It has learned how to assemble and control ever-bigger constellations of these lithium-ion batteries. The Long Beach facility, when it is completed, will have 18,000 battery modules, each the size of the power plant of the Nissan Leaf. But the timing is terrible.

CHEAP SOLAR SPURRING STORAGE WOES

The mega-battery won’t be up and running for five years, and Southern California needs more energy storage capacity yesterday. Officials warn that this summer, the region could face as many as 14 days of scheduled blackouts because of a huge leak earlier this year at the Porter Ranch natural gas storage facility. While the leak has stopped, the facility—which feeds fuel to 17 Los Angeles-area power plants—may not be fully recovered and tested for months.

Meanwhile, other utilities are suddenly feeling the need to store substantial quantities of electricity. As John Zahurancik, president of AES’s energy storage company, put it, “It’s a bit of a Wild West open market right now.”

The United Kingdom is shopping for energy storage systems to be installed around London, and New York state, Hawaii and Chile are looking at energy storage as an alternative to building more expensive power plants.

What’s driving this scenario is a growing abundance of cheap solar and wind power and entrepreneurs looking for ways to store and sell more of it. Meanwhile, power projections

of older coal- and gas-fired power plants are leading owners to shut more down, leaving more gaps in electricity distribution systems because they will no longer be able to compete with cheaper solar and wind power.

“We’re already caught up in the onset of a major transformation that’s going to happen. There are over a million solar rooftops now” in the United States, explained Guenter Conzelmann, a power sector analyst at the Department of Energy’s Argonne National Laboratory near Chicago.

Within two or three years, he estimates, there could be as many as 800,000 electric vehicles in the United States, an event that could drive prices for lithium-ion batteries further down and result in the storage of more renewable energy in the suburbs, at the edges of power systems that feed cities.

Car companies such as Tesla Motors Inc. are also offering big home batteries, close cousins of their car batteries, to store more renewable energy in homes. There are also “smart” appliances, such as dishwashers, water heaters, thermostats and refrigerators, coming into the market that are equipped to communicate with utilities to minimize electricity use during peak periods when electricity is most expensive.

“Eventually, homeowners could become almost energy self-sufficient. You may only need a few hours of electricity from the grid per year,” Conzelmann said.

Noting that the current power grid is not designed to handle big two-way power and communication flows, he suggests that more renewable energy will be beneficial and politically unstoppable.

“Everyone has an end vision. That’s pretty clear,” he said. “The problem is, how do we get there? That’s where a lot of the research that’s going on is all about. Can we have all these different attributes that we want without screwing up?”

LARGE-SCALE SOLAR BATTERIES GO FROM ‘CUTE’ TO CRITICAL

So far, most utilities have finessed the issue of accumulating solar power by allowing homeowners with solar arrays to sell some of their power back to the grid, a practice called net metering.

“You’re basically using the grid as a battery. This is why some utilities are a little bit leery about this. The big question is, who pays for it?” said Haresh Kamath, a senior manager at the Electric Power Research Institute (EPRI), a nonprofit group funded by the electric utility industry.

Big, grid-sized batteries can run into the millions of dollars, but the damages from blackouts and power surges caused by wildly fluctuating voltages can easily run into the billions.

“You can get some interesting effects on the grid which are not good if the voltage gets too high or you get some reliability issues,” Kamath said.

The need for renewable energy storage has emerged relatively recently among the engineers who worry about the health of the grid. “Starting off a few years ago, it was a novelty. ‘Oh, that’s cute,’ people would say. You’re trying to do large-scale batteries,” said

Vince Sprenkle, a chief engineer for energy storage at the Pacific Northwest National Laboratory in Washington state.

Five years ago, he recalls, the Energy Storage Association held its annual meeting in Charlotte, N.C., and 300 people showed up. “This year, they came back to Charlotte, and there were 1,500.”

According to Sprenkle, energy storage solutions and timetables will be different for different regions of the United States.

California is already feeling the crunch, but it may not come to the Pacific Northwest for another five or 10 years. Wind and solar power are beginning to penetrate the Northwest’s part of the grid, but when it fluctuates—as it always does—power demands can easily be balanced by the region’s hydroelectric power. Hydroelectric dams, with excess storage capacity and pump storage facilities that pump water up to a hilltop reservoir when electricity is cheap and then run it through turbines when it isn’t, can function like big batteries.

But the demand for more renewable electricity is going up, and the capacity for more hydro is small. Fielding more and bigger batteries may be much cheaper than building new hydroelectric facilities, Sprenkle thinks.

“Ideally, storage is your greatest flexible asset you can put on the grid,” he said.

WAITING FOR BIG BATTERIES TO HIT THE ROAD

At the moment, utilities are just beginning to use pilot projects to explore how bigger batteries might help them use the nation’s increasingly congested electric highway.

Fittingly, most of these pilots explore the storage uses of lithium-ion batteries. They were invented in the United States and languished for years until Sony Corp., the Japanese electronics company, commercialized them to power tiny machines like video cameras and cassette players.

Soon, they were bringing more power and longer life to cellphones, power tools and model airplanes. And these led to more ambitious commercial experiments.

In 2006, Tesla put 6,800 lithium-ion model airplane batteries under the hood of a kit-built roadster. That led to Tesla’s first car, the sporty Tzero, and a small but accelerating movement in the auto industry toward the plug-in electric vehicle.

AES, the Arlington, Va., company that is designing the 100 MW battery to store power for the western region of Los Angeles, was the first to take the next and probably the most ambitious and expensive leap by bringing lithium-ion car batteries to power one of the world’s biggest machines: the North American power grid.

For reference, the output of 100 MW is roughly a tenth of the power delivered by a modern nuclear power plant.

“We tend to not be focused on pilots, but on more commercial ventures,” explained Zahurancik, president of the company’s nuclear storage unit.

The parent company owns and operates power plants in 17 countries around the world. It has the money, the expertise and the ambition to create new businesses. One of the

partners in this project was A123 Systems LLC, a Waltham, Mass., developer and manufacturer of advanced lithium-ion car and bus batteries.

HOW REFINING 'FREQUENCY REGULATION' PAVED THE WAY TO LA

In 2010, a caravan of AES trucks hauled a line of 53-foot shipping containers up Laurel Mountain in West Virginia. Blazoned with labels saying "Smart. Power. Delivered," the containers carried 320 A123 electric vehicle batteries. They were parked in parallel rows near a wind farm, whose 61 turbines were generating electricity near the windy hilltop.

More trucks arrived, pulling shorter shipping containers. They contained the transformers, inverters and other control equipment needed to connect the batteries to power lines leading from the wind farm. Other containers had the air conditioning equipment to keep the growing maze of big batteries from overheating. Finally, a master control system was added.

What looked like a wire-strewn commercial parking lot was connected to a substation of what was then Allegheny Power, one of the utilities involved in the massive PJM Interconnection LLC, a regional transmission organization whose lines feed wholesale electricity to 13 states in the eastern United States.

Before 2011, when this giant, outdoor battery was turned on, PJM had run out of pump storage to control the growth of wind power, which accumulates most quickly at night. In some areas, PJM was forced to pay utilities to take wind power to keep its frequency of power delivery balanced. On that point, the grid is very demanding. The frequency of oscillations in its alternating current must be pegged at a measure defined as 60 hertz.

If the current goes above that, the switches protecting expensive power equipment from overloads begin to shut down the system. "If it goes too low, you can start to cause systematic failures that lead to brownouts and other things," said Zahurancik.

What the Laurel Mountain project was designed to do is called "frequency regulation." The wind power stored in the batteries feeds more juice onto the grid when power demands increase. When there is too much electricity coming into the system, its batteries suck more into storage. It can make these adjustments in a second, thus saving the excess power to sell at higher prices the next day. It was good for the grid, good for expanding markets for renewable energy and good for the innovator. It led to bigger jobs for AES, including the Los Angeles project.

"AES has always been a company that's trying to look at where do you go next. Is there a better way to serve?" said Zahurancik.

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VIDEO: LOCKHEED MARTIN F-35B ROARS AT FARNBOROUGH AIRSHOW

Jul 14, 2016 | Aviation Week & Space Technology

http://aviationweek.com/defense/lockheed-martin-f-35b-roars-farnborough-airshow?NL=AW-05&Issue=AW-05_20160715_AW-

[05_841&sfvc4enews=42&cl=article_5&utm_rid=CPEN1000001477803&utm_campaign=6448&utm_medium=email&elq2=52cc8b24c7b74fc1a47f57f2e7fb353a](http://www.foxnews.com/travel/2016/07/11/module-plane-design-concept-could-end-airport-gridlock-forever.html)

Lockheed Martin's F-35 Joint Strike Fighter finally made its Farnborough Airshow debut this week, impressing visitors to the trade show with its hovering capabilities.

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MODULE PLANE DESIGN CONCEPT COULD END AIRPORT GRIDLOCK FOREVER

By Josh Lew, Travel Pulse, Published July 11, 2016

<http://www.foxnews.com/travel/2016/07/11/module-plane-design-concept-could-end-airport-gridlock-forever.html>



Could clip-in airplane capsules make airports more efficient? (Switzerland's Federal Polytechnic Institute)

A new airplane design created by Swiss scientists could end airport gridlock forever.

The idea, from Switzerland's Federal Polytechnic Institute, calls for airplanes to have separate, interchangeable elements that can be mixed and matched as needed.

STREAMLINING THE TRAVEL PROCESS

Passengers would board capsules or "pods" without wings or engines that could then be attached to a plane. This could potentially help fliers avoid the need to wait in line at the airport during boarding. Also, instead of changing planes to catch a connecting flight, they would simply have to remain inside their capsule while it was transferred to another plane.

According to designers, the pods would be intermodal. This means that passengers could travel by road or rail and then remain inside while the capsule is transferred to a plane. The idea is not unlike the way that cargo is now transported by shipping container. Containers can easily be transferred from rail to ship to truck without ever being opened or unloaded.

Indeed, the concept, called Clip-Air, could be used to transport cargo and passengers on (or, rather, under) the same plane.

VIDEO OF THE CONCEPT IS AVAILABLE AT THE WEBSITE.

POTENTIAL DRAWBACKS

Like other concept planes, Clip-Air is undeniably a long way from becoming reality. However, the designers decided to work under a rigorous set of rules so that the idea is, at least, technically possible.

Despite this, Clip-Air has some serious drawbacks. First of all, the design, which calls for the wings and fuselage to be separate from the cabin pods, is not very aerodynamic. In an age when airlines are putting a premium on fuel efficiency, it would be difficult for such a design to gain traction.

Also, if the pods were large, they would not be able to travel on the current road and rail infrastructure. So even if the capsule plane idea itself is technically possible, it would take a significant amount of development in other transportation industries before the whole intermodal concept could become a reality.

This is an important issue because the designers envision rail and air transport working together. The project's web site explains: "The premise behind Clip-Air is to bring rail transport's flexibility to air transport and to make airports reach all the way into railway stations."

Furthermore, how would TSA deal with different pods coming from different places? This setup seems like a nightmare for a security agency that is notoriously slow to adapt to changes.

And then there is the cost of updating airport infrastructure so that there is equipment in place to attach and remove the pods. At least in the early years of Clip-Air planes, flying could be very, very expensive while airlines and airports recoup their investment.

AN ATTRACTIVE IDEA NONETHELESS

Even with these drawbacks, the idea of being able to streamline the transportation process in an age when going to the airport leads to headache after headache for fliers, is certainly an attractive one.

IT'S A STARTING POINT FOR NEW EXPLORATION

Even the designers admit that the plane itself is not 100 percent practical. However, turning this concept into reality is not the only reason that the project was made public. Ideas like creating a closer connection between rail and air transport and finding ways to streamline

the airport process are very relevant to the improvement of the current transportation infrastructure.

Clip-Air's creators explain that there are concepts beyond the concept plane that are important for the near-term development of rail and airports. "The plane is a starting point for the exploration of new fields of research, such as alternative energy, economic and societal impact or airport architecture of tomorrow."

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5G APPROVED BY FCC: 100 TIMES FASTER THAN 4G

by **CHRISS W. STREET** 15 Jul 2016 Newport Beach, CA 282

<http://www.breitbart.com/california/2016/07/15/5g-approved-fcc-100-times-faster-4g/>



Josep Lago / AFP / Getty

The U.S. Federal Communications Commission voted unanimously on Thursday to open nearly 11 gigahertz of high-frequency spectrum for the roll out of "5G" mobile, flexible and fixed-use broadband wireless that may be 100 times faster than 4G.

Regulators on July 14 approved the set-aside of a large portion of the airwaves spectrum to allow the United States to be the first country to launch so-called fifth generation (5G) blazingly-fast wireless services.

Many analysts thought that the 5G race would be won by the \$1.5 billion joint government effort called the 5G Creative Mobile Strategy, launched in 2014 by South Korea and Japan, with the goal of deployment for their respective 2018 Winter Olympics and 2020 Summer Olympics.

Unlike Asia and Europe, the United States never formed an official, government-sanctioned 5G development effort, preferring to rely on the entrepreneurial spirit of private enterprises and academic research.

New York University Polytechnic School of Engineering launched a dedicated program in August 2012 that quickly developed the millimeter-wave technologies and other research deemed crucial to 5G deployment.

U.S. corporations, such as Verizon Communications Inc (VZ:NYSE) and AT&T Inc (T:NYSE), moved quickly to embrace 5G networks that promised speeds at least 10 times and perhaps 100 times faster than today's 4G networks.

According to FCC Chairman Tom Wheeler, the U.S. will be "the first country in the world to identify and open up vast amounts of high-frequency spectrum for 5G applications. The big game-changer is that we are using much higher-frequency bands than previously thought viable for flexible uses, including mobile."

Verizon and AT&T have said they will begin deploying 5G trials in 2017, and the first commercial deployments at scale are expected in 2020, Wheeler said. T Mobile US, a unit of Deutsche Telecom (DTE:ETR), and Sprint Corp (S:NYSE) are also undertaking trials.

The FCC said the key to 5G is developing new rules that balance spectrum use between new wireless services, satellite operations and federal government use. Boeing Corp (BA:NYSE) told the FCC last week that the company and "the rest of the satellite industry have supported common-sense rules that would promote true sharing."

The FCC will make spectrum available and rely on a process led by the private sector for producing technical standards.

FCC Commissioner Jessica Rosenworcel commented, "We are on the cusp of cars that drive themselves, streets that can be safer, emergency services that are more effective, healthcare that is more personalized, and more capability across the board because we are more connected."

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NEW SENSOR MEASURES AIRCRAFT VELOCITY BY BOUNCING LASERS OFF AIR MOLECULES

Chris Wood July 15, 2016

British defense and aerospace company BAE Systems has come up with some interesting technology over the years, including armored vehicles that used Formula 1 suspension tech, and army helmets that use bone conduction for comms. Now, it's looking to improve how we measure airspeed, replacing conventional, air-pressure-based systems with tech that bounces around ultraviolet lasers to get the job done.



Known as the Laser Air Speed Sensing Instrument (LASSI), the new system was developed by scientists in Chelmsford in the UK (Credit: BAE Systems)

Conventional air speed sensors take the form of small tubes, known as pitot tubes, that protrude from aircraft. These are combined with small holes positioned at right-angles to the direction of flight, positioned either somewhere on the pitot tubes themselves, or elsewhere on the aircraft.

The conditions inside the right-angle holes describe the normal conditions outside the aircraft, something that's known as "static" air pressure, while those inside the pitot tubes, which are positioned towards the direction of flight, detail the pressure created by the forward motion of the aircraft. The difference between the two observed pressures is used to indicate airspeed.

Pitot tubes usually have heating apparatus built in, but they're still prone to icing up under really cold conditions. By their very nature, they're also vulnerable to collisions with birds, and they're not particularly accurate at low speeds.

The new system, known as the Laser Air Speed Sensing Instrument (LASSI), was developed by BAE Systems scientists working in Chelmsford in the UK. Instead of relying on air pressure, the new technology makes use of an ultraviolet laser.

The laser is used to bounce light off the surrounding air molecules, and the change in the color of the reflected beam, as caused by the Doppler Effect, is measured.

This can be thought of in a similar way to the classic police siren example of the Doppler Effect. Just as the sound of the approaching object is altered as the frequency of the wave changes when the object moves closer and then further away, the frequency of the laser light (and therefore its color) is also altered depending on the relative velocity of the air molecules reflecting the light back to the detector.

The ultraviolet light is invisible to the human eye, but tiny changes in its color can be picked up by the system's detector. Essentially, the larger the degree of color change in the reflected light, the faster air molecules are moving relative to the craft, and therefore the faster the vehicle is moving.

BAE has already conducted ground vehicle and wind tunnel testing of LASSI, and the team is now looking to scale down the system, targeting use in aircraft within the next five years. Overall, the it could provide a big upgrade over current methods.

"LASSI can be located completely inside the aircraft and is accurate at low airspeeds." said BAE Systems' Dr Leslie Laycock. "These features should ensure that the equipment is robust against damage, requires less maintenance and be easier to operate at lower airspeeds."

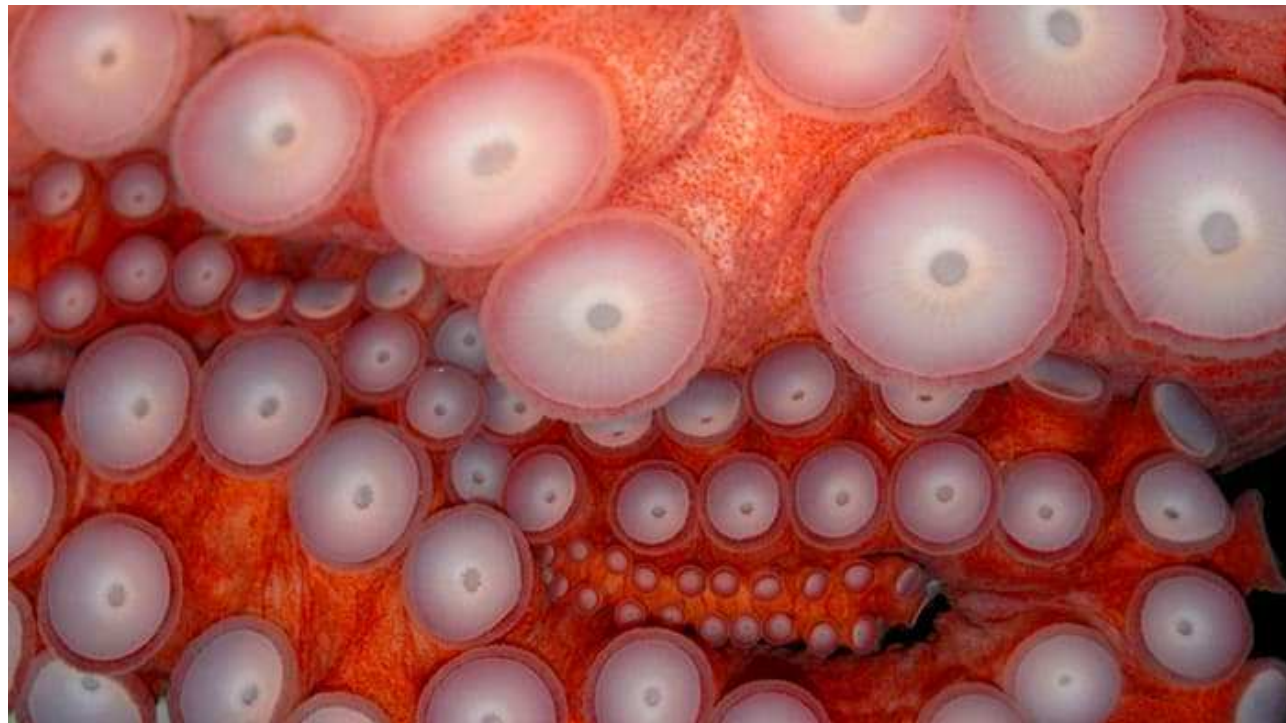
Source: BAE Systems

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NEXT-GEN ADHESIVE BASED ON OCTOPUS SUCKERS

Ben Coxworth July 14, 2016

<http://www.gizmag.com/octopus-sucker-adhesive/44360/>



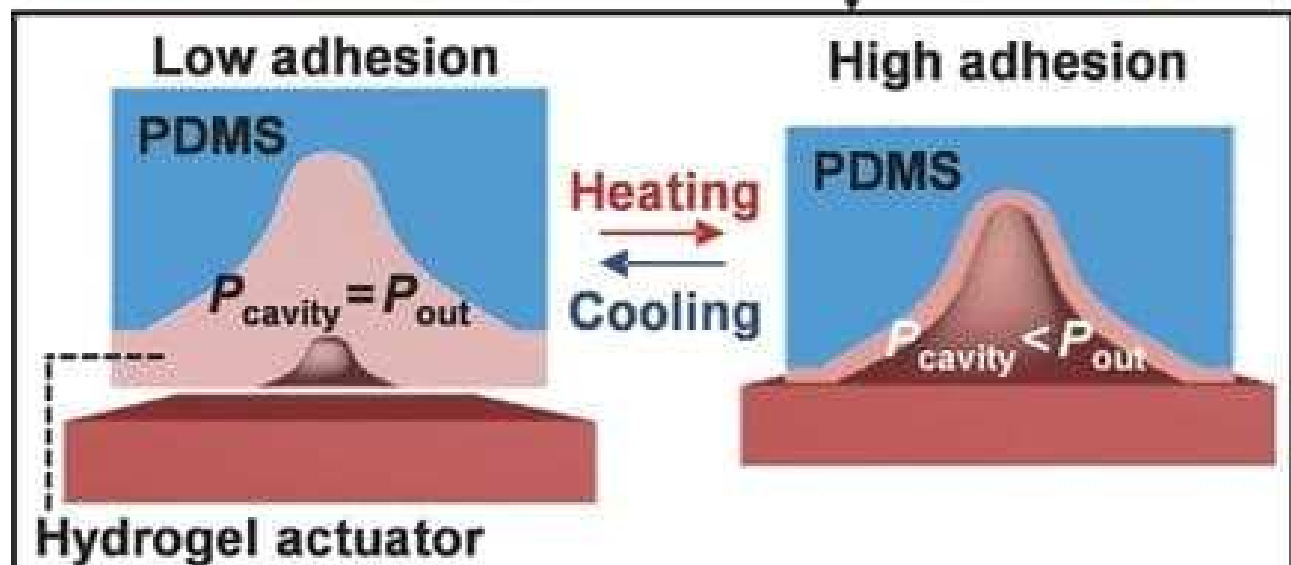
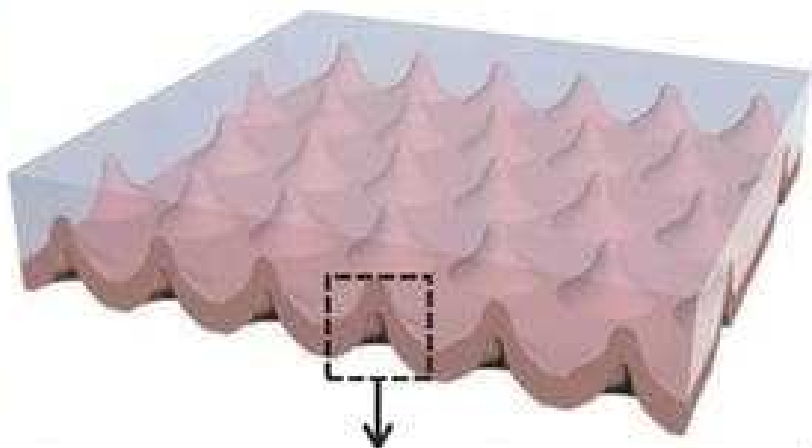
Octopus sucker discs – the genuine article (Credit: steve_lodefink/CC 2.0)

Along with their unique propulsion system and ability to change color, octopi are also known for their grabby tentacles. Now, Korean scientists have developed a material that mimics the sucker discs on those tentacles. It could be used for adhesive pads that are reversible, reusable, fast-acting, and effective even in wet conditions.

A real octopus sucker disc has a hollow cavity in the middle, surrounded by a ring of muscle tissue. The size of the cavity is controlled by the octopus making that tissue thicker or thinner – the thinner the muscle tissue, the larger the cavity, and the lower the air pressure within it. A larger cavity creates more suction, while a smaller one causes the disc to release.

The scientists, from the Korea Institute of Science and Technology (KIST) and Ulsan National Institute of Science and Technology (UNIST), made their pad using rubbery polydimethylsiloxane (PDMS) studded with an array of tiny pores. Each of those pores is lined with a thermally-responsive polymer.

Octopus-inspired smart adhesive pad



At room temperature, the polymer stays relaxed, and the pad doesn't stick. Once the temperature of the material is raised to 32 °C (89.6 °F), however, the polymer contracts. This causes the pores to open up, each one acting like a tiny sucker disc. As a result, the pad sticks to whatever surface it's laid upon.

Amongst other possible applications, it is hoped that the pads could be used as a substrate for bandages or medical sensors that stick to the skin at normal body temperature, but that can be released simply by exposure to cold water.

A paper on the research was recently published in the journal *Advanced Materials*.

Source: UNIST

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SPACEX TO LAUNCH VITAL NEW SPACESHIP DOCKING PORT FOR SPACE STATION

By Sarah Lewin, Staff Writer | July 14, 2016 11:51am ET

<http://www.space.com/33416-spacex-launching-international-docking-adapter.html>



NASA's International Docking Adapter-2 (IDA-2) being tested at the Space Station Processing Facility prior to its scheduled July 18, 2016, launch. Credit: NASA

When SpaceX's robotic Dragon capsule launches on a new supply run to the International Space Station (ISS) on Monday (July 18), it will carry a vital piece of hardware in its trunk: the first of two new docking ports that will allow future

private space taxis to link up automatically with the orbiting lab.

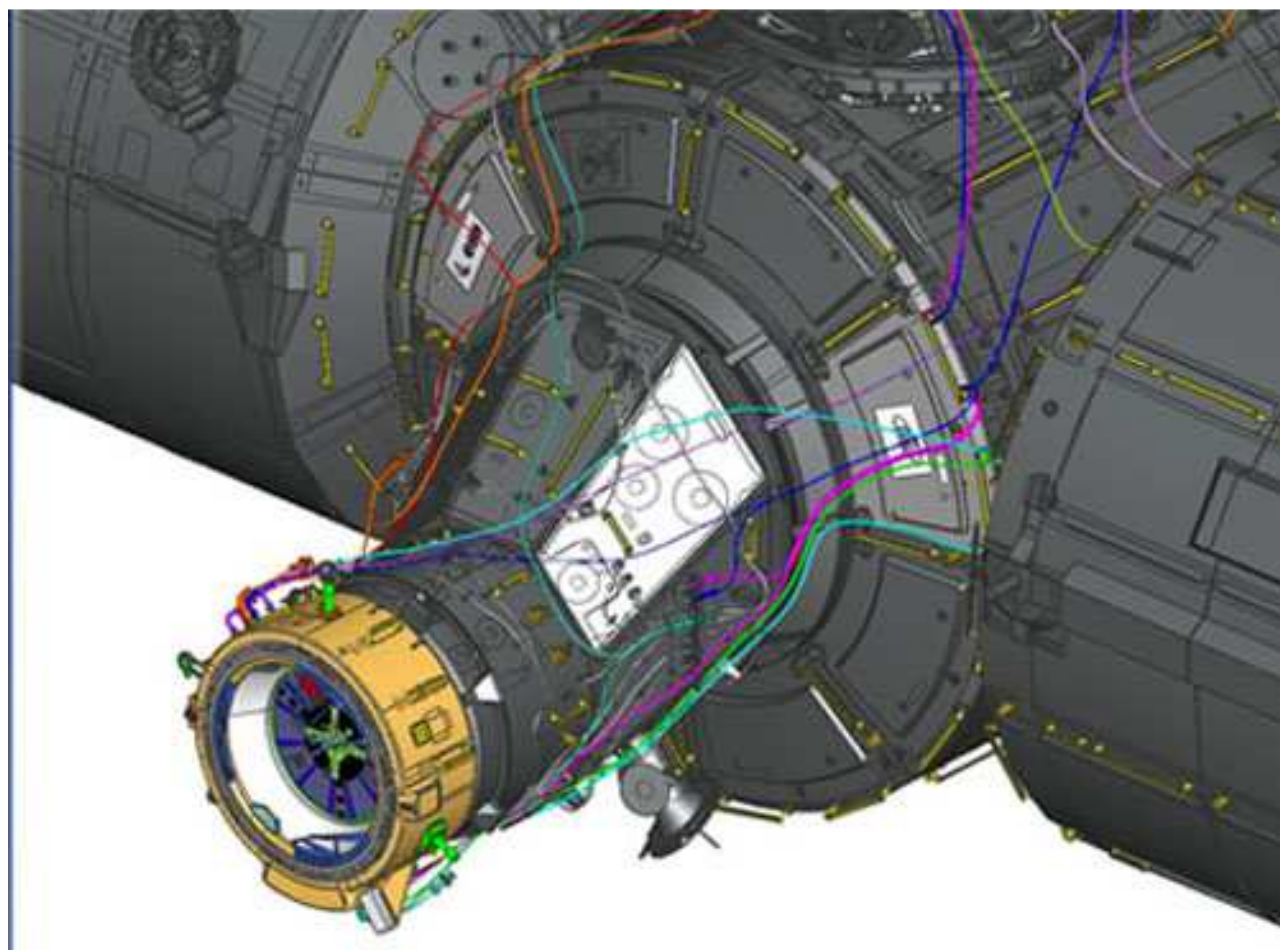
Right now, only Russian vehicles — crewed Soyuz spacecraft and robotic Progress freighters — can dock with the space station, using special ports on the Russian side of the orbiting complex. Cargo spacecraft launched to the American part of the station currently need to be grappled by space station crew.

But that will change soon. The new docking ports, called International Docking Adapters (IDAs), follow a new international standard and are designed to let a variety of vehicles dock with the ISS on their own. [Spacewalkers Pave Way for New ISS Docking Port (Video)]

That's "the big darn deal about IDA," David Clemen, Boeing's director of development/modifications for the space station, said in a teleconference yesterday (July 13).

"There's an international docking system standard that was developed by the ISS partners to establish a standard for all future docking for not only the ISS but for future space vehicles," Clemen added. "And this will be the first component that was built to that standard and will be brought to ISS."

Boeing is one of two companies — SpaceX is the other — to have contracts with NASA to launch astronauts to the space station. Both SpaceX's Crew Dragon capsule and Boeing's CST-100 Starliner capsule are on track to begin crewed flights to the station in 2017, NASA officials have said.



An illustration of the IDA-2 attached to the side of the International Space Station. The adapter will let piloted and automatic spacecraft easily dock at the standardized port, without extra help from space station astronauts. Credit: NASA

The IDA is a big ring that measures 3.2 feet (1 meter) tall; the inside is 5.25 feet (1.6 m) across. Its overall diameter, including sensors and other tools around the entryway, measures 7.8 feet (2.4 m), NASA officials said in a statement. The adapter's design was approved by representatives of Russia, Canada, Japan and the European Space Agency to be a standard interface.

This will be the second try to get an IDA to the station. SpaceX's Dragon spacecraft was also carrying an IDA when it blasted off on a cargo mission in June 2015 — a flight that ended less than 3 minutes after liftoff, when its Falcon 9 rocket broke apart.

The adapter will travel to orbit in the rear trunk of Dragon, which NASA astronaut Jeff Williams will grapple with the space station's robotic arm. Later, once the craft is berthed to the station, the arm will pull the IDA from Dragon's trunk and move it about 1 foot (0.3 m) from the front of the port where it will be installed, NASA officials explained. Then, astronauts will perform a spacewalk to install it on the station, where it will fit over the top of an old space shuttle docking port. The second adapter, which will fly up separately next year, will fit over another such port.

"On the U.S. side, we have two large docking mechanisms that were used for the shuttle ... and they're really not available anymore," Kirk Shireman, NASA's space station program manager, said during yesterday's news conference. "Those were built back by Russia years ago, and they don't use them on their side — they don't exist, basically, anymore. We needed to have a new mechanism."

Dragon's interior will carry about 3,800 lbs. (1,700 kilograms) of supplies and materials, including a lot of interesting components for science experiments aboard the orbiting lab. This gear includes a tiny DNA sequencer, to try sequencing DNA in space for the first time; living heart cells to test microgravity's effect on the beating heart; and a phase-change material heat exchanger that could freeze and thaw to help keep astronauts from getting too hot or too cold aboard the ISS.

Also aboard Dragon are microorganisms found in the area of the old Chernobyl nuclear reactor in Ukraine, which famously melted down in 1986. Researchers want to see how the microbes fare in microgravity, to inform strategies for radiation therapy.

Like the docking adapters, many of the space station experiments are testing technology that will be helpful as humans travel farther into space, NASA officials said.

Shireman discussed how the adapters will have uses beyond the space station. For example, a similar adapter fitting the same requirements could be used with the Orion spacecraft in orbit near the moon, he said.

"This is the first piece, but [the use of] IDA and this international docking standard has a long future ahead of it," Shireman said.

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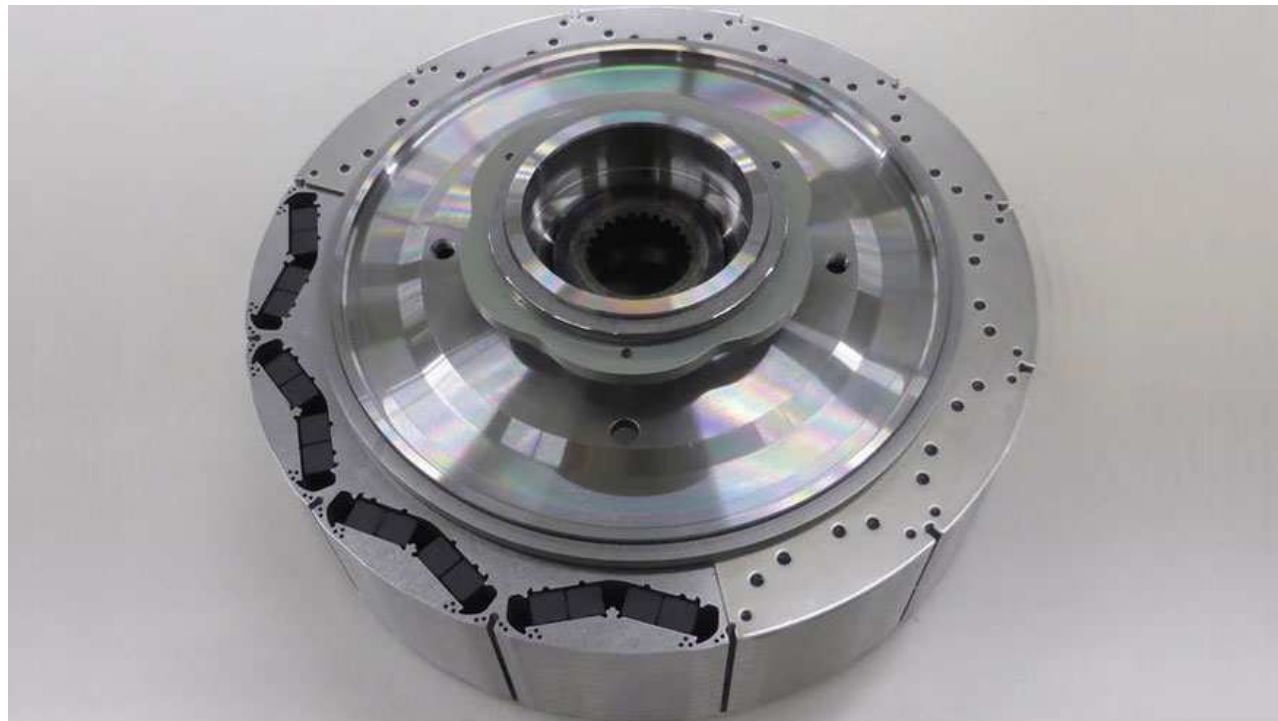
HONDA DEVELOPS BREAKTHROUGH ELECTRIC MOTOR FOR HYBRIDS

FoxNews.com, Published July 14, 2016

<http://www.foxnews.com/leisure/2016/07/14/honda-develops-breakthrough-electric-motor-for-hybrids/>

It's not called the Honda Motor Company for nothing.

The Japanese automaker has freed its hybrids of the need for heavy rare earth elements. Working with Daido Steel, the automaker has developed the first magnet suitable for automotive drive applications that doesn't require materials like dysprosium or terbium to improve its heat resistance.



(Honda)

Instead, the neodymium-iron magnets are manufactured using a new hot deformation method to create a fine crystal grain structure that can handle high temperatures without the additives. Honda designed an all-new motor to accommodate them.

The sourcing of heavy rare earth elements has been an issue for the automotive and electronics industries in recent years as China has a near monopoly on their production and has often been accused of restricting their supply for economic and political ends. Neodymium is classified as a light rare earth, but is more widely available.

Honda will introduce the new motor this year in a hybrid version of an Asian-market minivan called, somewhat appropriately, the Freed and plans to quickly expand its use to other hybrid models. However, the technology is not yet ready to withstand the higher temperatures generated when used in a pure-electric car.

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SPACEX AIMS TO RE-LAUNCH LANDED ROCKET THIS FALL

By Mike Wall, Space.com Senior Writer | July 17, 2016 08:30am ET

<http://www.space.com/33444-spacex-reusable-rocket-first-reflight-this-fall.html>



The first stage of SpaceX's Falcon 9 rocket lands on the deck of the robotic ship "Of Course I Still Love You" on April 8, 2016. The company aims to re-fly this booster in autumn 2016. Credit: SpaceX

SpaceX appears poised to notch another big reusable-rocket milestone.

The California-based company has successfully landed the first stage of its Falcon 9 rocket during orbital launches four times in the past seven months. SpaceX eventually wants to re-fly such boosters, as a way to reduce the cost of spaceflight and further open the heavens to exploration.

"Eventually," it turns out, could be just a few months away. [Reusable Rocket Launch Systems: How They Work (Infographic)]

"On the reflight of the recovered booster, that's going to be most likely in fall this year," Hans Koenigsmann, vice president of flight reliability at SpaceX, said during a news conference Saturday (July 16) that previewed the Monday (July 18) launch of the company's robotic Dragon cargo capsule toward the International Space Station (ISS).

"Of course, we need to have a customer," Koenigsmann added. "We're in talks right now, but we haven't finalized those talks at this point in time."

But SpaceX has decided which rocket will be the first to lift off for the second time, Koenigsmann said. It's the booster that launched the previous Dragon cargo mission to the

ISS, on April 8, and then came back down for a soft landing on a robotic "drone ship" in the Atlantic Ocean.

"We are prepping the booster again," Koenigsmann said. "Well, first of all, we have to wash them, right? They come back slightly blackened. And you have to go through a series of tests with the hardware on the booster itself, to make sure everything's working."

SpaceX's first successful landing came this past December, during a commercial satellite launch from Cape Canaveral Air Force Station in Florida. That Falcon 9 first stage came back on terra firma, touching down a few miles south of the launch pad.

The next three landings — the April 8 success, as well as two more in May — came on the drone ship. The Falcon 9 often cannot carry enough fuel to make it all the way back to dry land during launches to geostationary transfer orbit (which lies 22,300 miles, or 35,890 kilometers, from Earth) and other distant destinations, SpaceX representatives have said.

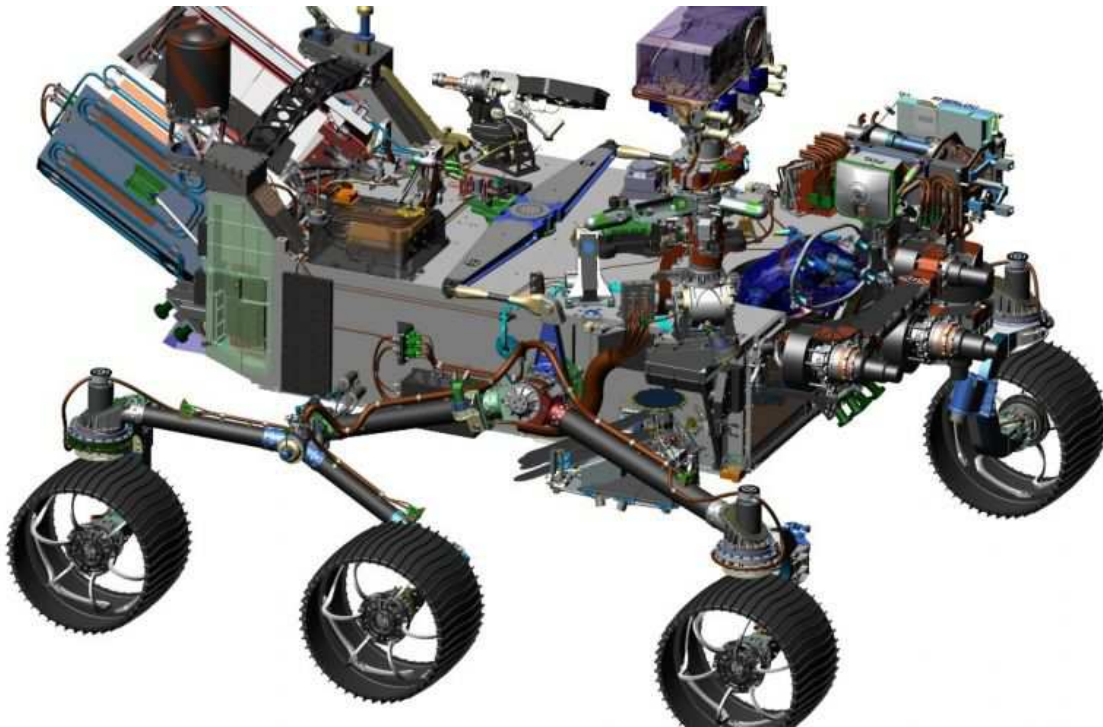
Monday morning's Dragon launch — which is scheduled to take place at 12:45 a.m. EDT (0445 GMT) from Cape Canaveral — will also feature a landing attempt. Like SpaceX's first touchdown success, this try will come on terra firma, at Cape Canaveral's Landing Zone 1, Koenigsmann said.

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NASA'S NEXT MARS ROVER WILL 'SEEK THE SIGNS OF LIFE' ON RED PLANET

By Rob Verger, FoxNews.com, Published July 15, 2016

<http://www.foxnews.com/science/2016/07/15/nasas-next-mars-rover-will-look-for-signs-of-life-on-red-planet.html>



This image is from computer-assisted-design work on the Mars 2020 rover. The design leverages many successful features of NASA's Curiosity rover, which landed on Mars in 2012, but also adds new science instruments and a sampling system to carry out new goals for the 2020 mission. (NASA/JPL-Caltech)

NASA gave a glimpse into its plans for its next Martian rover on Friday, a craft that will focus on looking for evidence of life on the red planet and preparing samples for possible return to Earth someday.

The still-unnamed rover will launch in the summer of 2020 (so the space agency is calling the program Mars 2020) and will arrive at its destination in February of 2021. NASA scientists gave an overview of the program today to the public in an event that was streamed on Facebook Live and NASA TV.

The rover's main job will be to "seek the signs of life" and try to answer the question of whether or not we're alone, Kenneth Farley, a project scientist on the Mars 2020 team, said. Mars today is very different than it was over 3.5 billion years ago, a time when the planet was warmer and wetter and thus more conducive for life, so the new project will focus on studying that era.

The nuclear-powered rover will be capable of taking core samples of the planet, which it will drop off in caches as it goes. Those samples could someday be returned to Earth for analysis.

The craft, which will weigh about 2,300 pounds, is expected to have a dramatic, high-tech entry to the planet, Allen Chen, the project lead on the craft's entry, descent, and landing, said. It will be traveling 11,000 mph when it arrives at Mars, and will eventually be lowered onto the surface by sky crane, like Curiosity was.

But this rover will be smarter, Chen said. It will be able to figure out on its own the optimal time to deploy the parachute, giving it more precision with its landing. It will also be able to take pictures as it descends and compare those to an onboard map, a system called Terrain Relative Navigation. Cameras will not only capture the descent, but peer up at the parachute as well.

The craft will also have thicker, more robust wheels than Curiosity, NASA said, but will resemble that craft—which is currently exploring Mars—in general. Farley said that they had narrowed the landing sites to eight different choices, with half of locations being places where surface water once flowed, the traces of which are "recorded in the rocks."

In addition to a myriad of instruments, including a laser, the rover will also have microphones on it, hopefully giving people the chance to one day hear what it's like on Mars.

"This will be a great opportunity for the public to hear the sounds of Mars for the first time, and it could also provide useful engineering information," Matt Wallace, the Mars 2020 deputy project manager, said in a statement.

I WOULD HAVE ENJOYED AN ARTICLE ABOUT THE LESSONS LEARNED BY NASA ON THE EARLIER MARS ROVERS. EXAMPLE, HOW THE WHEELS ON THE PREVIOUS ROVERS FAILED AND WHAT IS BEING DONE TO ADDRESS THESE FAILURES FOR THE LONGEST LIFE POSSIBLE. YOU GET THE IDEA, I AM AN ANAL RETENTIVE ENGINEER. UT

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SPACE X MAKES SPECTACULAR GROUND LANDING AFTER DRAGON LAUNCH

David Szondy July 17, 2016

<http://www.gizmag.com/spacex-dragon-crs-9-launch-landing/44386/>

SpaceX scored a double success today by sending a Dragon into orbit and nailing another ground landing.

At 12:45 am EDT, the CRS-9 mission lifted off from Space Launch Complex 40 (SLC-40) at Cape Canaveral Air Force Station in Florida, setting an unmanned Dragon cargo ship on course for a rendezvous with the International Space Station (ISS).

SpaceX says that the launch, second stage separation, and deployment of the Dragon spacecraft were carried out without incident. Shortly afterwards, the first stage Falcon 9 booster flew back to Cape Canaveral, where it landed at Landing Zone 1. This is the second time that the Falcon 9 has managed a landward landing and the first since the Orbcomm 2 mission last December.

The ninth of up to 20 missions by SpaceX to the ISS, CRS-9 carries 5,000 lb (2,270 kg) of supplies, equipment, and science experiments as well as a replacement for the docking ring lost in the destruction of CRS-7. The new Docking Adaptor-2 allows any manned spacecraft or unmanned cargo ship to dock with one another at any angle of rotation.



Falcon 9 touching down (Credit: SpaceX)

The Dragon will spend the next two days making a series of course corrections to match its orbit with the ISS, after which it will be captured by a robotic arm and guided to a docking berth on the station. Later, the arm will remove the docking ring from the Dragon's unpressurized cargo section and guide it to the Harmony module, where spacewalking astronauts will make the final connection.

The Dragon is scheduled to spend over a month at the ISS before returning to Earth for a splashdown in the Pacific Ocean off Baja, California, where it will be recovered.

The video AT THE WEBSITE recaps the CRS-9 launch.

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WE WON'T FINISH DISCOVERING NEW TREES IN THE AMAZON FOR 300 YEARS

By Nathaniel Scharping | July 15, 2016 3:22 pm

<http://blogs.discovermagazine.com/d-brief/2016/07/15/we-wont-finish-discovering-new-trees-in-the-amazon-for-300-years/#.V4zzZNQrlrg>

While millions of people are out hunting Pokémon, biologists are conducting an equally fervent hunt for new and rare species. And instead of 151 species, they estimate that they need to find another 4,000 or so before they become the very best.

A new study builds a compendium of all the tree species collected from the Amazon over past three centuries, and concludes that we won't find them all until 2316. In total, researchers from the Field Museum say researchers have, so far, collected 11,676 unique tree species from the Amazon rainforest, and that there are likely some 16,000 there in total, based on recent projections.

(Credit: Dr. Morley Read/Shutterstock)

These estimates assume, of course, that the ongoing destruction of the rainforest and climate change don't get to them first.

The number of trees pales in comparison to the number of plants estimated to exist in the Amazon total — around 50,000 species.

There are also around 1,300 species of birds and 427 species of mammals that call the South American rainforest home. The researchers published their work Wednesday in the journal *Scientific Reports*.

About 50 percent of the trees brought back from the rainforest belong to only 745 species, say the researchers, meaning that many of the specimens collected have only been



observed a few times. In total, collections in the rainforest average only about ten for every 60 square miles. The Amazon covers over 2 million square miles total, so biological treasures surely wait within. Previous leafy finds from the Amazon led to the discovery of the rubber tree and the cinchona tree, which is used to make the malaria drug quinine. The researchers hope that future finds will yield similarly enticing discoveries.

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"HARPOON" NEGATES NEED FOR OPEN-HEART SURGERY

[Danny Gallagher](#) July 18, 2016

http://www.gizmag.com/harpoon-medical-heart/44410/?utm_source=Gizmag+Subscribers&utm_campaign=9fdfb23fae-UA-2235360-4&utm_medium=email&utm_term=0_65b67362bd-9fdfb23fae-91341709

Open-heart surgery is risky and can take patients months to recover from. Researchers at the University of Maryland Medical Center have developed a device that eliminates the need for such surgery for those suffering degenerative mitral regurgitation (MR). Not only does the device reduce time spent on the operating table, but it could eventually see patients heading home from hospital the day after a heart operation.

Degenerative mitral regurgitation is a common heart valve disorder that affects around eight million people in the US alone. It is caused by a leaky heart valve, in which the small cords that control the valve's flaps are broken or stretched and cause blood to flow in the wrong direction. To repair the valve, invasive open-heart surgery is carried out to replace the small cords in a procedure that requires surgical skill and experience.



The Harpoon TSD-5 can repair broken or stretched cords that control the opening and closing of heart valve flaps without the need for open heart surgery (Credit: Harpoon Medical)

The Harpoon TSD-5 device built by Harpoon Medical of Baltimore is based on technology developed by the University of Maryland Medical Center and makes the job easier for surgeons and safer and less intrusive for patients.

The device looks a spray attachment for a garden hose with a long needle on the end of it. It enters the heart through a small puncture in the patient's ribcage that's guided to the damaged flaps through echocardiographic imaging. The device can install artificial cord material through the damaged flap while the heart is still beating – so a heart-lung bypass machine isn't required – and tie a knot to keep the cord in place through an automated process. The cords can also be adjusted as the heart beats to achieve the optimum length.

In the first clinical study of the device, funded by Harpoon Medical, surgeons used the Harpoon TSD-5 to implant artificial cords in 11 patients in Poland. The team says three or four cords are required in most cases. All 11 patients showed a reduction in MR following their successful implants and remained stable for the next 30 days.

"We think this approach is applicable to probably three-quarters of patients with degenerative disease, which is the number one reason why people come to the operating room for surgery for mitral valve regurgitation," says James Gammie, a professor and chief of cardiac surgery at the University of Maryland School of Medicine who served as the principle investigator for the study. "We think this is a safer approach than open heart surgery. We think the safety profile is going to be better and, ultimately, people will be able to go home from the hospital the next day."

The results of the study were published in the journal [Circulation](#).

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SPACEX WILL ATTEMPT TO LAND THREE ROCKETS AT ONCE

[Ria Misra](#), July 19, 2016

<http://gizmodo.com/spacex-will-attempt-to-land-three-rockets-at-once-1783908606>

A launch of the Falcon Heavy's smaller cousin, the Falcon 9 (Image: [SpaceX](#))

Having successfully launched and landed a few single rockets, SpaceX is now planning a simultaneous triple rocket landing. This is going to look cool.

SpaceX [told The Orlando Sentinel](#) that it's seeking government permission for two extra landing pads in preparation for the launch of the new Falcon Heavy rocket. The private spaceflight company says that it might attempt to land its Falcon Heavy rockets on one of its drone barges—a protocol that the SpaceX has [nearly perfected](#) in the past year. Eventually, however, SpaceX wants to land three rockets on solid ground. The extra two ports SpaceX hopes to build at Cape Canaveral's Air Force Base, where the company already has one port, would give it the real estate to do that.

When the Falcon Heavy launches, it will be the [world's most powerful rocket](#), beating the [current title-holder, the Delta IV](#), with more than twice the power. The Falcon Heavy will be capable of lifting up to 54 tons of weight into space. To get that much thrust, it actually

has three separate rocket cores, and that means that the company will need multiple landing pads to successfully save all three rockets.

Musk went on Twitter to further explain that two of those rockets [would land practically simultaneously](#), while the third would arrive after a slight delay. You can see how the process would unfold in this animation the company put together:

Three rocket landings at once certainly sounds like something to see, but Musk also went on to hint at one more landing down the road. While the rocket cores in the Falcon Heavy are designed to return, the upper stage of the rocket is not—not yet anyways. Musk tweeted:

Prob best to stay focused on the Mars rocket, indeed.

VIDEO OF THE PROPOSED LIFT OFF AND LANDING OF THE FALCON HEAVY AT THE WEBSITE.

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From: Stephanie Osborn

PROMINENT RUSSIAN SCIENTIST: 'WE SHOULD FEAR A DEEP TEMPERATURE DROP — NOT CATASTROPHIC GLOBAL WARMING'

'Warming had a natural origin...CO2 is 'not guilty'

By: Marc Morano - Climate Depot October 27, 2009 7:37 AM

<http://www.climatedepot.com/2009/10/27/prominent-russian-scientist-we-should-fear-a-deep-temperature-drop-not-catastrophic-global-warming/#ixzz4EDjqzKL5>

THE SUN DEFINES THE CLIMATE

(Habibullo Abdussamatov, Dr. Sc. – Head of Space research laboratory of the Pulkovo Observatory, Head of the Russian/Ukrainian joint project Astrometria – (translated from Russian by Lucy Hancock) Dr. Abdussamatov is featured on page 140 of the 2009 U.S. Senate Report of More Than 700 Dissenting Scientists Over Man-Made Global Warming. Also see “Related Links” below.)

Key Excerpts: Observations of the Sun show that as for the increase in temperature, carbon dioxide is “not guilty” and as for what lies ahead in the upcoming decades, it is not catastrophic warming, but a global, and very prolonged, temperature drop. [...] Over the past decade, global temperature on the Earth has not increased; global warming has ceased, and already there are signs of the future deep temperature drop. [...] It follows that warming had a natural origin, the contribution of CO2 to it was insignificant, anthropogenic increase in the concentration of carbon dioxide does not serve as an explanation for it, and in the foreseeable future CO2 will not be able to cause catastrophic warming. The so-called greenhouse effect will not avert the onset of the next deep temperature drop, the 19th in the last 7500 years, which without fail follows after natural warming. [...] We should fear a deep temperature drop — not catastrophic global warming. Humanity must survive the serious economic, social, demographic and political consequences of a global temperature drop, which will directly affect the national interests of almost all countries and more than 80% of

the population of the Earth. A deep temperature drop is a considerably greater threat to humanity than warming. However, a reliable forecast of the time of the onset and of the depth of the global temperature drop will make it possible to adjust in advance the economic activity of humanity, to considerably weaken the crisis.

Excerpts: Experts of the United Nations in regular reports publish data said to show that the Earth is approaching a catastrophic global warming, caused by increasing emissions of carbon dioxide to the atmosphere. However, observations of the Sun show that as for the increase in temperature, carbon dioxide is “not guilty” and as for what lies ahead in the upcoming decades, it is not catastrophic warming, but a global, and very prolonged, temperature drop.

Life on earth completely depends on solar radiation, the ultimate source of energy for natural processes. For a long time it was thought that the luminosity of the Sun never changes, and for this reason the quantity of solar energy received per second over one square meter above the atmosphere at the distance of the Earth from the Sun (149 597 892 km), was named the solar constant.

Until 1978, precise measurements of the value of the total solar irradiance (TSI) were not available. But according to indirect data, namely the established major climate variations of the Earth in recent millennia, one must doubt the invariance of its value.

In the middle of the nineteenth century, German and Swiss astronomers Heinrich Schwabe and Rudolf Wolf established that the number of spots on the surface of the Sun periodically changes, diminishing from a maximum to a minimum, and then growing again, over a time frame on the order of 11 years. Wolf introduced an index (“W”) of the relative number of sunspots, computed as the sum of 10 times number of sunspot groups plus the total number of spots in all groups. This number has been regularly measured since 1849. Drawing on the work of professional astronomers and the observations of amateurs (which are of uncertain reliability) Wolf worked out a reconstruction of monthly values from 1749 as well as annual values from 1700. Today, the reconstruction of this time series stretches back to 1611. It has an eleven-year cycle of recurrence as well as other cycles related to onset and development of individual sunspot groups: changes in the fraction of the solar surface occupied by faculae, the frequency of prominences, and other phenomena in the solar chromosphere and corona.

Analyzing the long record of sunspot numbers, the English astronomer Walter Maunder in 1893 came to the conclusion that from 1645 to 1715 sunspots had been generally absent. Over the thirty-year period of the Maunder Minimum, astronomers of the time counted only about 50 spots. Usually, over that length of time, about 50,000 sunspots would appear. Today, it has been established that such minima have repeatedly occurred in the past. It is also known that the Maunder Minimum accompanied the coldest phase of a global temperature dip, physically measured in Europe and other regions, the most severe such dip for several millennia, which stretched from the fourteenth to the nineteenth centuries (now known as the Little Ice Age).

The search for a relationship between large climate variations and phenomena observed in the Sun led to an interest in finding a connection between periods of change in the terrestrial climate and corresponding significant changes in the level of observed solar activity, because the sunspot number is the only index that has been measured over a long period of time.

Determinative role of the Sun in variations in the climate of the Earth

The Earth, after receiving and storing over the twentieth century an anomalously large amount of heat energy, from the 1990's began to return it gradually. The upper layers of the world ocean, completely unexpectedly to climatologists, began to cool in 2003. The heat accumulated by them unfortunately now is running out.

Over the past decade, global temperature on the Earth has not increased; global warming has ceased, and already there are signs of the future deep temperature drop (Fig. 7, 11). Meantime the concentration of carbon dioxide in the atmosphere over these years has grown by more than 4%, and in 2006 many meteorologists predicted that 2007 would be the hottest of the last decade. This did not occur, although the global temperature of the Earth would have increased at least 0.1 degree if it depended on the concentration of carbon dioxide. It follows that warming had a natural origin, the contribution of CO₂ to it was insignificant, anthropogenic increase in the concentration of carbon dioxide does not serve as an explanation for it, and in the foreseeable future CO₂ will not be able to cause catastrophic warming. The so-called greenhouse effect will not avert the onset of the next deep temperature drop, the 19th in the last 7500 years, which without fail follows after natural warming.

The earth is no longer threatened by the catastrophic global warming forecast by some scientists; warming passed its peak in 1998-2005, while the value of the TSI by July – September of last year had already declined by 0.47 W/m² (Fig. 1).

For several years until the beginning in 2013 of a steady temperature drop, in a phase of instability, temperature will oscillate around the maximum that has been reached, without further substantial rise. Changes in climatic conditions will occur unevenly, depending on latitude. A temperature decrease in the smallest degree would affect the equatorial regions and strongly influence the temperate climate zones. The changes will have very serious consequences, and it is necessary to begin preparations even now, since there is practically no time in reserve. The global temperature of the Earth has begun its decrease without limitations on the volume of greenhouse gas emissions by industrially developed countries; therefore the implementation of the Kyoto protocol aimed to rescue the planet from the greenhouse effect should be put off at least 150 years.

[...]

Consequently, we should fear a deep temperature drop — not catastrophic global warming. Humanity must survive the serious economic, social, demographic and political consequences of a global temperature drop, which will directly affect the national interests of almost all countries and more than 80% of the population of the Earth. A deep temperature drop is a considerably greater threat to humanity than warming. However, a reliable forecast of the time of the onset and of the depth of the global temperature drop will make it possible to adjust in advance the economic activity of humanity, to considerably weaken the crisis.

For complete paper see here:

http://www.gao.spb.ru/english/astrometr/abduss_nkj_2009.pdf

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From: "Keith A. Glass" salgak@comcast.net

DATA STORAGE BREAKTHROUGH COULD STORE THE LIBRARY OF CONGRESS ON A DUST MITE

The densest data storage device ever invented.

By [William Herkewitz](#), Jul 18, 2016

<http://www.popularmechanics.com/science/a21877/data-storage-breakthrough-chlorine-atoms/>

Using this new data storage technique, you could fit the entire Library of Congress on a cube smaller than a dust mite—or the size of George Washington's pupil on a one dollar bill.

A team of nanoscientists led by Sander Otte at Delft University of Technology in the Netherlands has just unveiled the densest method ever developed to store re-writable digital data. By scooting around individual chlorine atoms on a flat sheet of copper, the scientists could write a 1 kilobyte message at 500 terabits per square inch. That's around 100 times more info per square inch than the most efficient hard drive ever created. Otte says the method could theoretically fit every book ever written onto a flat copper sheet the size of a postage stamp. The new storage device is [outlined today](#) in the journal Nature Nanotechnology.

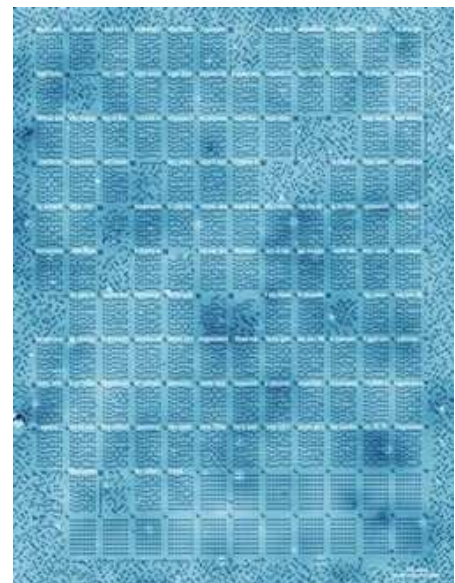
"This density is two to three orders of magnitude beyond current hard disk or flash technology. An advance of this size is remarkable, to say the least"—so writes Steven Erwin, a theoretical physicist with the U.S. Naval Research Laboratory who was not involved in developing the new technique, in an essay accompanying the scientific paper.

ROOM AT THE BOTTOM

An explanation of the bit logic and the atomic markers. TU Delft

Way back in 1959, renowned physicist Richard Feynman gave a famous speech at CalTech called "[There's Plenty of Room at the Bottom](#)." He spoke about the promise of writing with individual atoms, musing on how exactly you could store a fantastically large amount of data in an inconceivably small space. Today, Otte and his team took a page out of Feynman's book, and quite literally too.

Otte's team used individual atoms to encode a short section of Feynman's speech on a copper tablet about 100 nanometers wide and tall. That's so small it could fit on a Flu virus with room to spare. Otte and his colleagues then cleared the spaced and typed out a segment of *On the Origin of Species* by Charles Darwin using the same atoms.

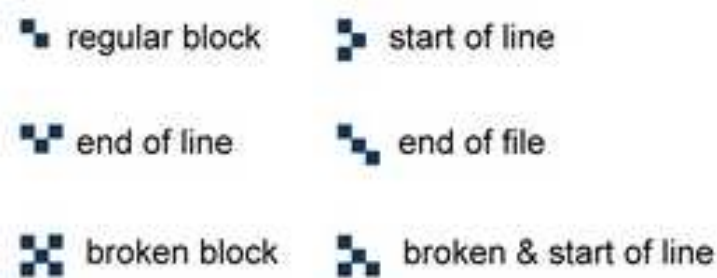
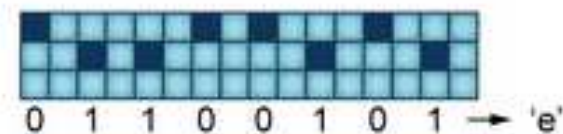


Here's how it's done: Otte's team found that they could put chlorine atoms onto a cold grid of copper metal and get them to form into perfect squares. Think of it like a checkerboard.

Any empty spot that was missing a chlorine atom would look like a dark square on Otte's checkerboard. Next, the researchers found they could scoot around the chlorine atoms on this grid, sort of like a [sliding block puzzle](#), and thus rearrange where the dark spots on the grid are. It's done with a tool called a scanning tunnelling microscope, which is a bit like an ultra-thin needle that can nudge atoms up and down, left and right.

To create the data storage device, Otte starts with a copper plate that's been randomly peppered with chlorine atoms, leaving plenty of blank spaces. He then scoots around the atoms until he's formed a larger 12-by-12 grid with chunks of ordered atoms and darker blank spaces. If any of these 144 chunks has some fatal error—say the copper underneath

has some elemental impurity—Otte can mark off that box as defective with a tiny 4-atom symbol in its upper left-hand corner.



The arrangement of atoms and blank spaces translates to individual bits of data. A blank space followed by a chlorine atom is a 0, while the reverse (a chlorine atom and then a blank space) is a 1. Using this method, Otte can store any digital information, be it lines from a speech or small segments of computer code.

ICE COLD

An explanation of the bit logic and the atomic markers. TU Delft

The scientists keep their copper tablets from being jumbled by storing them at hyper-cold temperatures and isolated in a vacuum. That's technology you won't soon see on a thumb drive, "so the [practical] storage of data on an atomic scale is still some way off. But through this achievement we have certainly come a big step closer," says Otte. At -320 Fahrenheit, the research team was able to store one of their 1 kilobyte records for about two days with no errors. And rewriting one of the copper slates is as simple as just moving around the chlorine atoms to form new combinations of ones and zeroes.

There's one other downside to Otte's method. It may be a dense way to store data, but it's also heartbreakingly slow. Reading a few short sentences on one of the copper blocks takes around 1 to 2 minutes, and writing them takes 10. But Otte's team is investigating new methods they believe could speed up their writing and readout speeds by an incredible amount, up to about 1 megabit per second, about a tenth as fast as the average U.S. computer downloads data online.

Video of concept:

https://www.youtube.com/watch?v=ZcU-sZJkh_U

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. . . . even if it's really a ducted-fan vehicle. . .

MOVE OVER, HOVERCRAFT: BUBBA WATSON HAS A JETPACK FOR THE OLYMPICS

By [Joel Beall](#)

<http://www.golfdigest.com/story/move-over-hovercraft-bubba-watson-has-a-jetpack-for-the-olympics>

Given the choice, the majority of professional golfers will walk over ride. That preference might change after they get a load of Bubba Watson's new toy.

Watson's never been shy in testing the limits of course transportation, famously illustrated in his [golffhovercraft](#). So to commemorate Watson's participation in golf's return to the [Summer Olympics](#),

Oakley, one of Bubba's sponsors, and marketing company Thinkmodo have produced this video of golf's first jetpack:

According to [Mashable](#), the BW-Air (yes, for Bubba Watson) is an experimental aircraft capable of flying at 46 mph and at an altitude of 3,000 feet. It's built by Martin Aircraft, and, if FAA approved, would likely cost around \$200,000.

Which seems like a lot of money. But eliminating the hassle of lugging four clubs across the fairway when your cart is restricted to "paths only"? You can't put a price on that.

Video: https://www.youtube.com/watch?time_continue=116&v=tpEkN1NdjKU

If you would like to unsubscribe From: THE REVENGE OF HUMP DAY, please send an email message to Tim Bolgeo tbolgeo@comcast.net and say, "QUIT SENDING ME THIS STUPID RAG!"
