

# SCIENCE

RUINING EVERYTHING SINCE 1543

A COLLECTION OF SCIENCE-THEMED COMICS

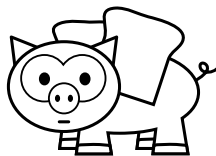
BY ZACH WEINERSMITH



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**breadpig**

BROOKLYN • SOMERVILLE • THE INTERNETS

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Breadpig is not a traditional publisher. The majority of the profits of this book are going to the author, Zach Weinersmith. And as with all of Breadpig's projects, the company's profits are being donated to a worthy charity. For this book, we have selected Wikipedia.

For support in this publishing venture, Breadpig thanks Marie Mundaca, LeeAnn Suen and the friends and family who've always unhesitatingly supported team Breadpig.

Even our winged porcine hero couldn't have done it alone. Thank you.

*To Kelly, whose eye-rolling at my scripts has no doubt  
been the main necessitator for her ever-thickening spectacles.*

## ACKNOWLEDGEMENTS

As always, I would like to thank my team of geeks: Amanda and Dean, Michael, Mark, and Josh. Without them, the many holes I put in the boat would not get plugged.

I would like to thank my publisher Breadpig, except for Alexis, who once offered Sabriya an empty glass of lemonade as if it were a gift.

I would like to thank Christina Xu in particular for her Powers of Internet.

I would like to thank my parents, whose support of my quarter-life lurch into science has truly been the gift that keeps giving.

I would like to thank all the awesome geeks who took time out of their busy schedules to give us their Tales of Science.

And lastly, I would like to thank my wife, Kelly. I feel like I shouldn't have to thank her here, since she's already in the dedication, but... man... she's scary when she's mad.

You hold in your hands the very first science-themed book of SMBC comics. If this book is anything like other books of science, I hope to release a new edition every few months, which will be just different enough from the old edition that your professor will make you buy it. I hope this because I love money. In fact, I believe money is the second most important thing in life. The first thing is real estate.

For your convenience, in this third SMBC book, we've slimmed things down a bit. The result is that some comics extend over multiple pages. In these cases, there is a friendly arrow at the bottom of each page until you reach the end of the comic. We have very cleverly labeled the end with the word "end."

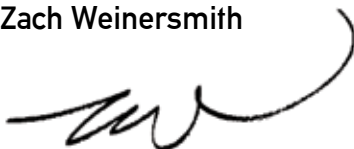
This book is divided into three sections. The first section contains lovingly selected science comics from the SMBC archive, many of which are too dorky to ever appear in an SMBC compilation meant for normal human beings—you know, those people you see when the curtains accidentally get let open.

The second section contains 17 comics that are exclusive to this book. Almost without exception, these are drawn from comic scripts that I thought were good, but which were probably too damn nerdy for those normal humans I mentioned in the last paragraph. But, that shouldn't be a problem for you and I, should it?

The third section contains Tales of Science. These are little stories given to us by some of my favorite scientists and science geeks who were awesome enough to grace this book with their presence.

Also, Phil Plait did one.

Zach Weinersmith

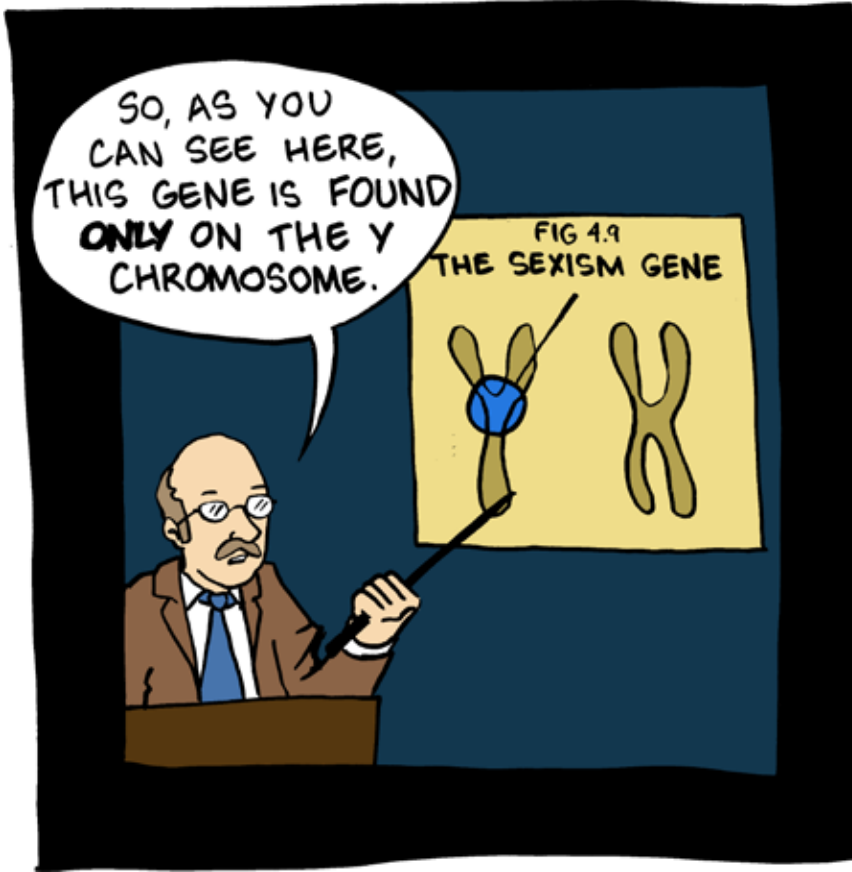
A handwritten signature in black ink, appearing to be 'Zach Weinersmith', with a large, sweeping flourish extending to the right.





Ahh, the first day teaching natural selection is always the best.

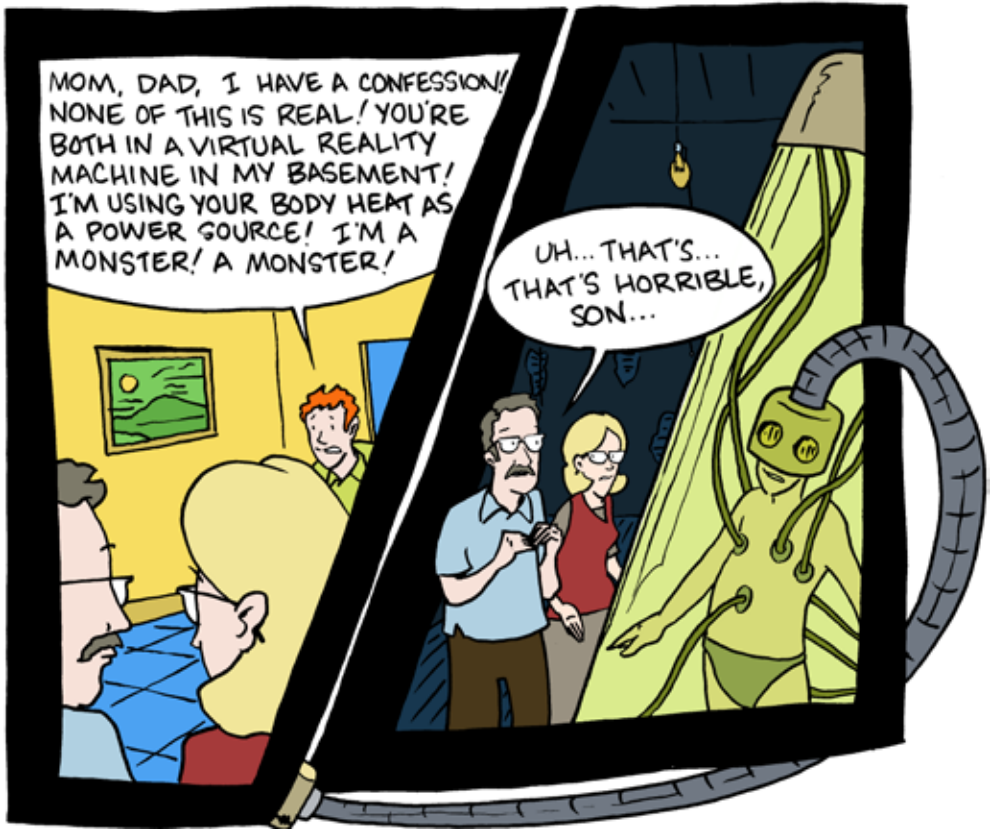




“You know, the chromosome that *matters*.”



If you were still alive, you'd probably wish Superman had paid more attention in physics class.



LIFE TIP: YOU CAN DO PRETTY MUCH ANYTHING IF YOU YELL THE RIGHT PHRASE

FOR SCIENCE!



SMBC PRESENTS: GREAT DEBATES  
~ EPISODE ONE ~  
CREATIONISM vs. EVOLUTION

QUESTION:

WHAT WOULD  
A CREATIONIST  
SAY WHEN  
CONFRONTED  
WITH  
ARCHAEOPTERYX  
?

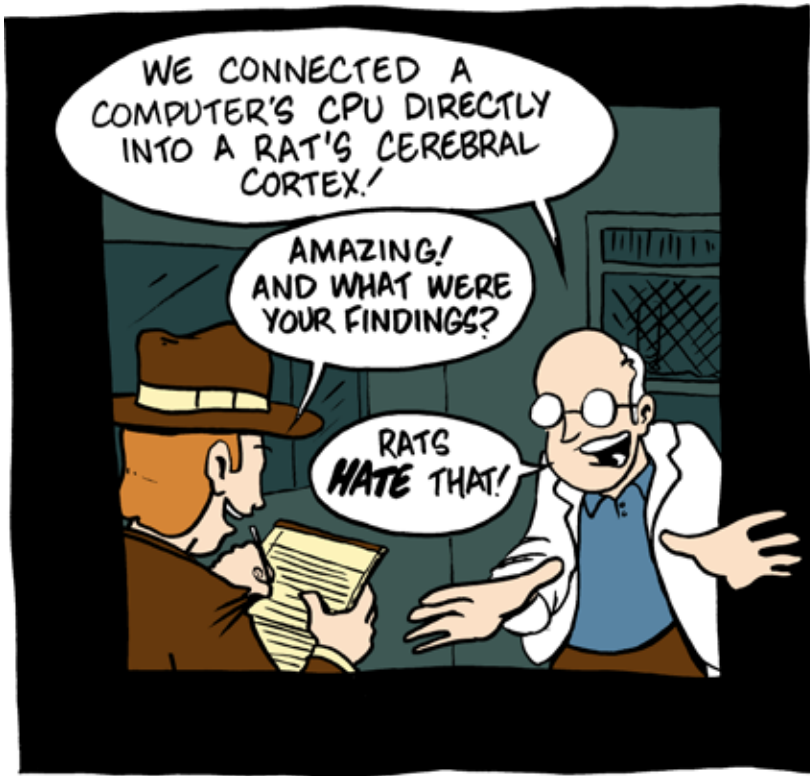
ANSWER:



AAAAGH!



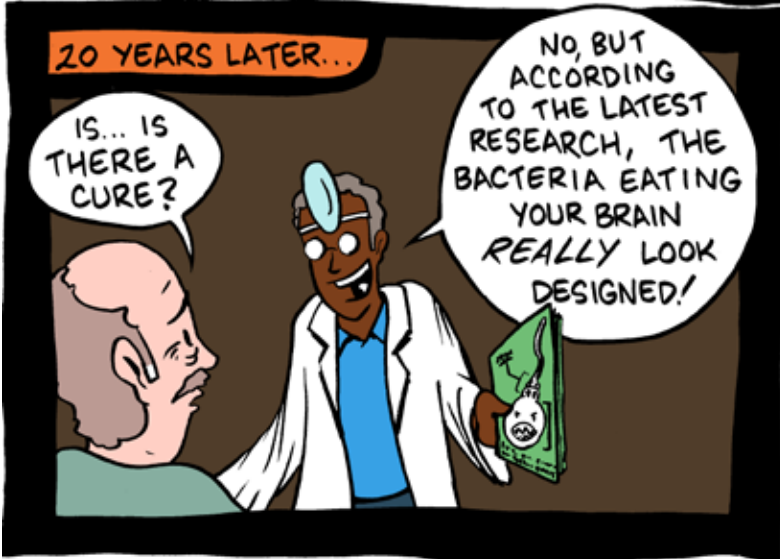
Particle physics has come  
a long way since the 1700s.

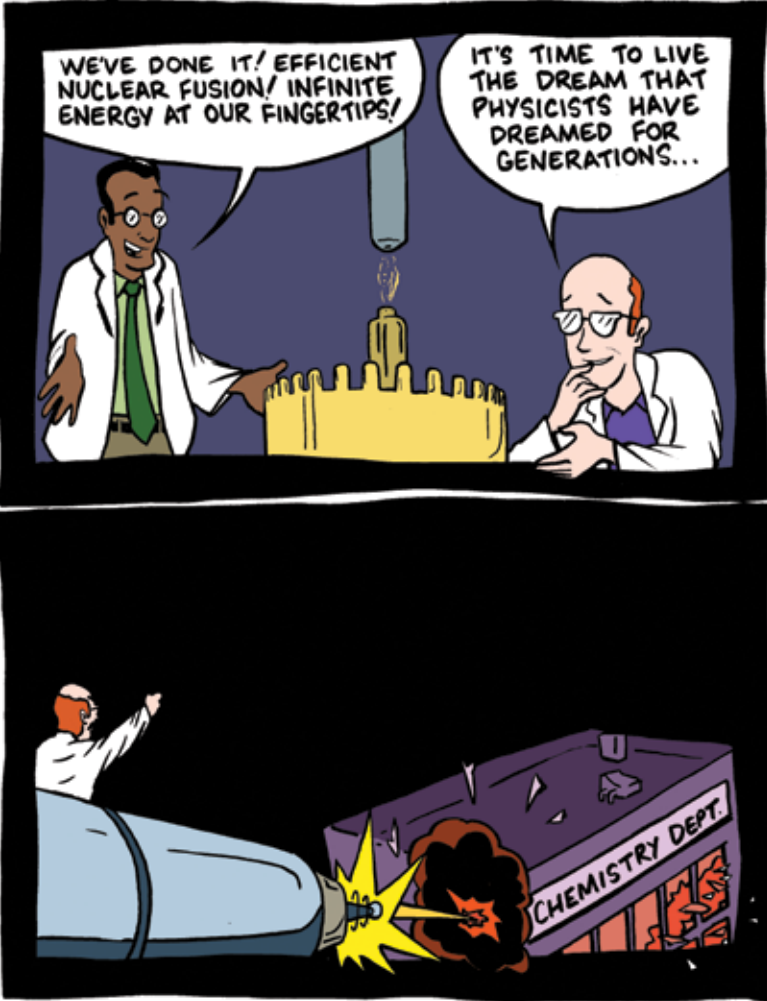




"...which I bought from a raptor."









February 17, 1982:

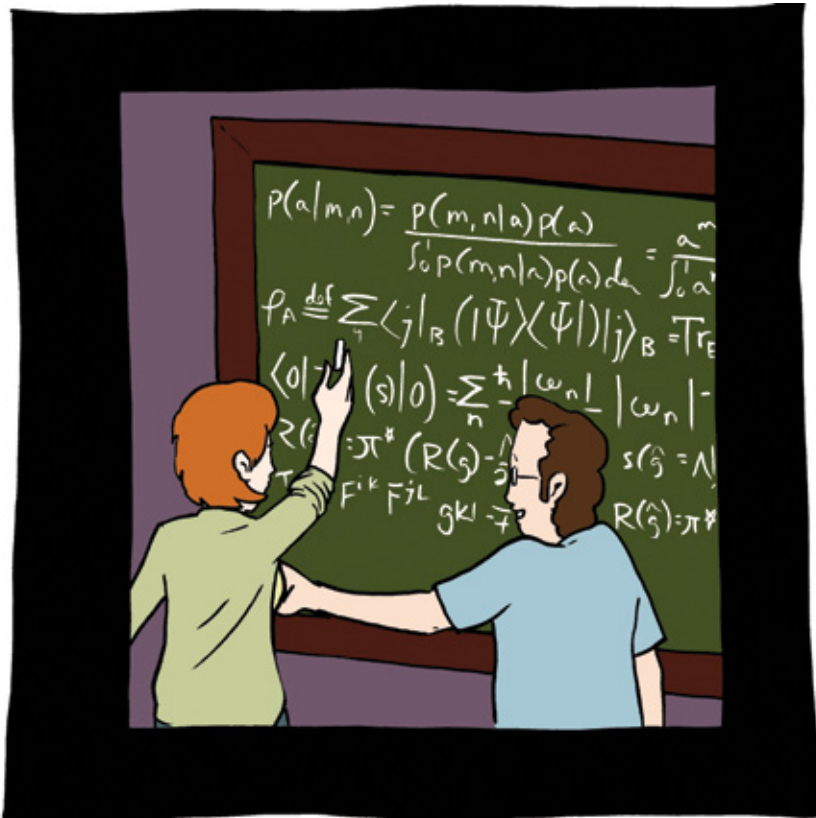
After months of grueling research,  
we have confirmed that if you turn  
the calculator upside-down,  
it spells "boobs."



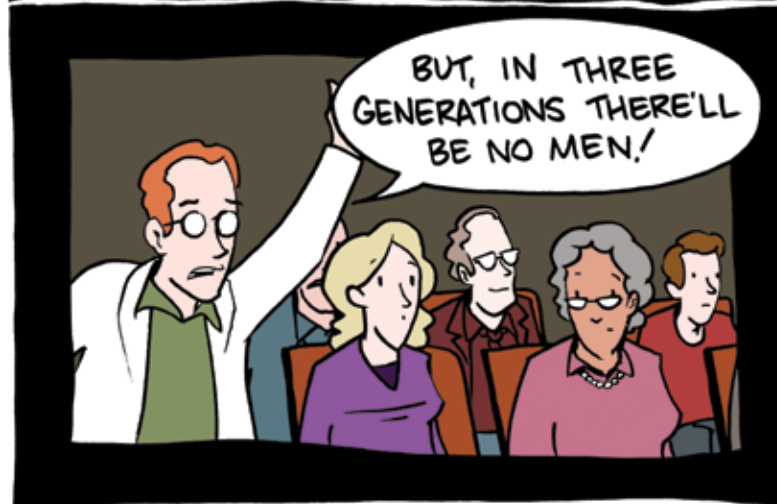
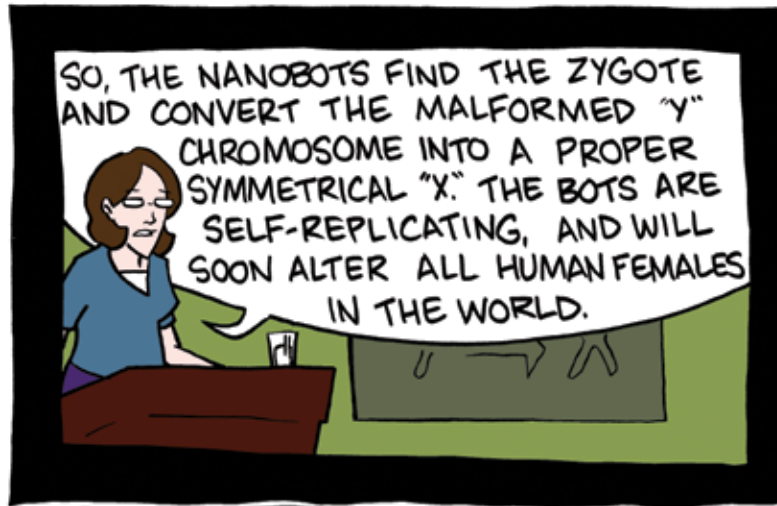


**END!**

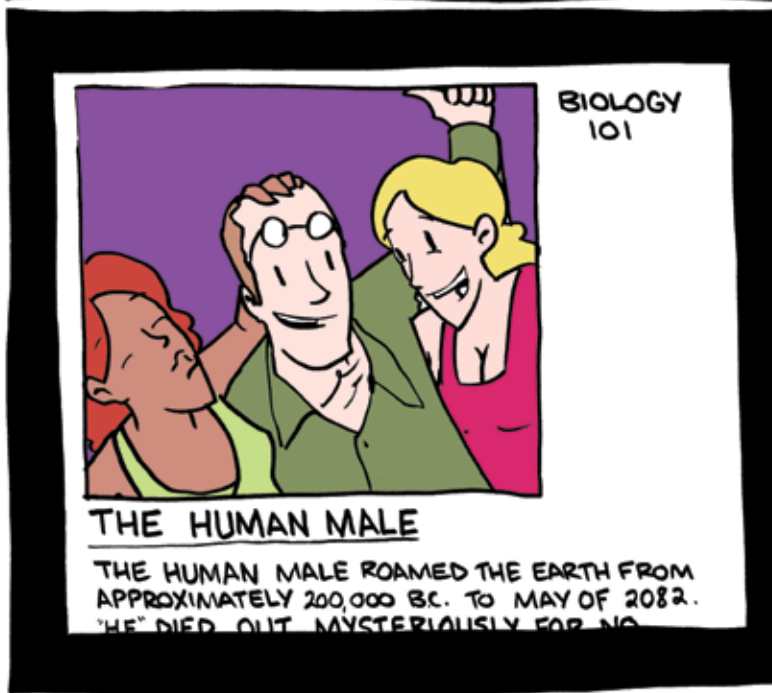




Moments after free will is disproved.







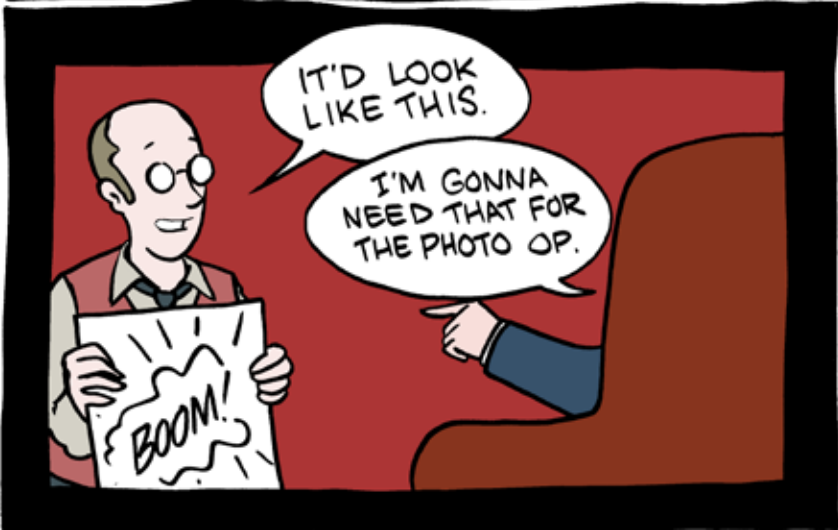
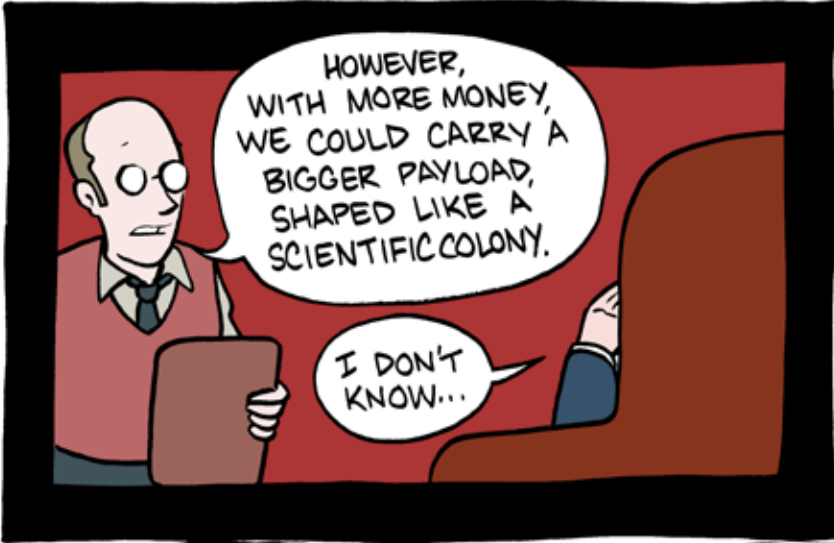
END!



# SCIENCE FUNDING EXPLAINED:







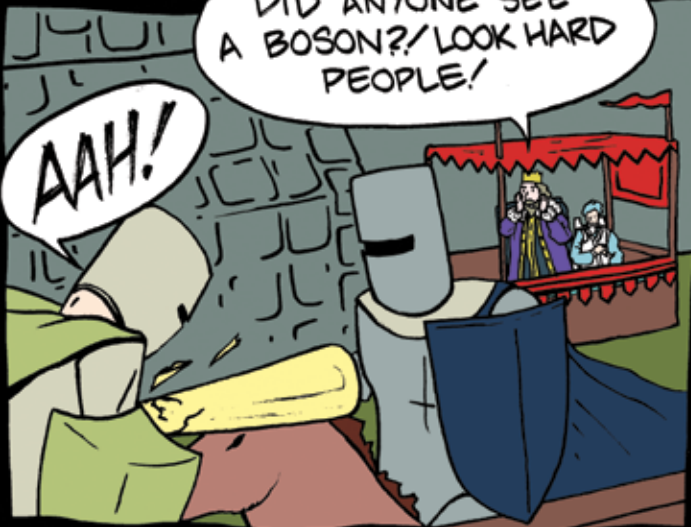
END!

YOU... YOU THINK WE DO THIS FOR FUN?!  
I'M TRYING TO COLLIDE PARTICLES FAST  
ENOUGH TO FIND THE HIGGS BOSON.  
MY GOD, MAN. WHAT KIND OF IDIOTS DO YOU  
THINK WE ARE?

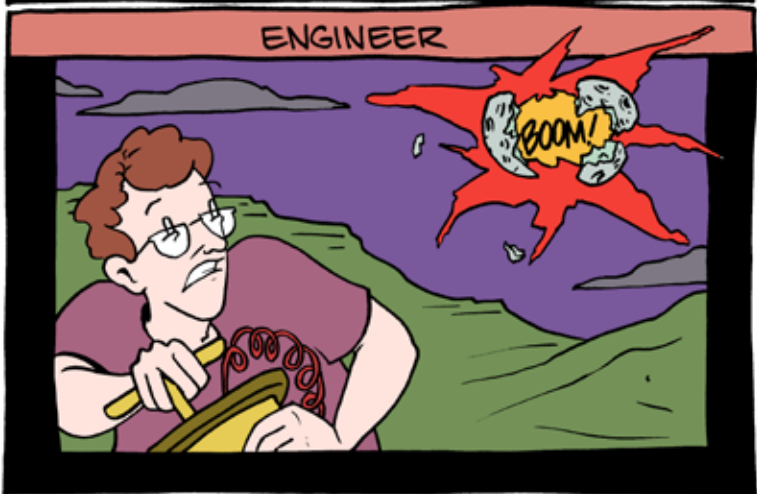
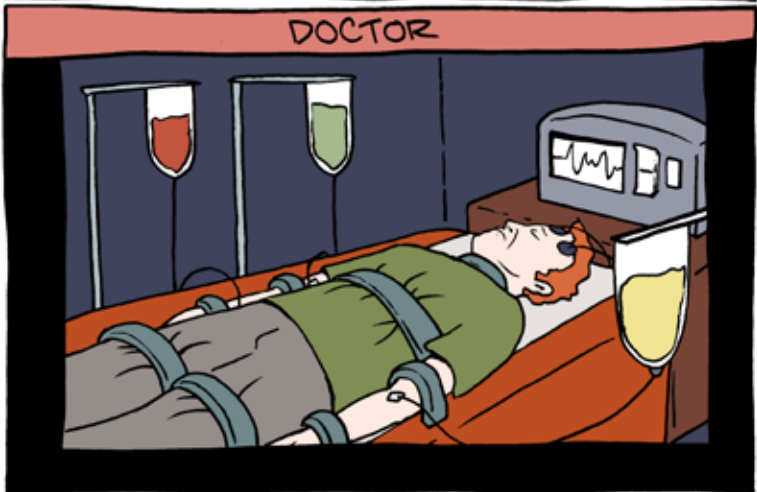
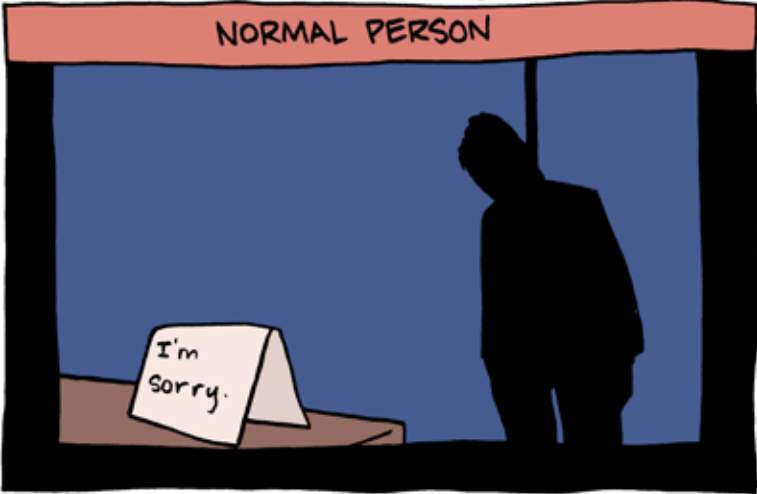


DID ANYONE SEE  
A BOSON?! LOOK HARD  
PEOPLE!

AAH!



# FIXING YOUR LYCANTHROPY: 3 APPROACHES :



# THE MICROBIOLOGY OF AGING

## YOUTH

THIS IS WHITE BLOOD CELL 48128Z. WE HAVE A WOUND IN SECTOR 16.

WOW! HE MUST BE FIGHTING A WAR OR SOMETHING!



## ADULTHOOD

IMMEDIATE RENDEZVOUS IN AREA 12!

AGAIN? SHE MUST BE WONDERFUL.

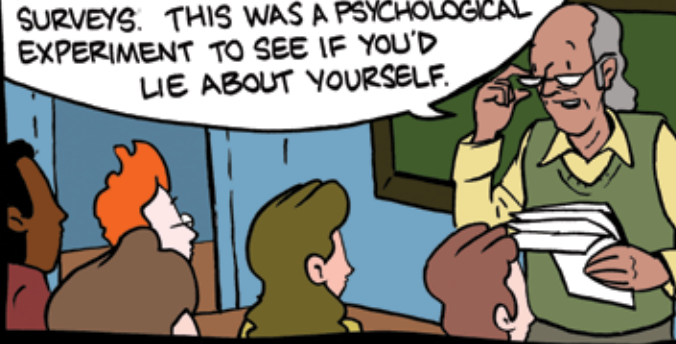




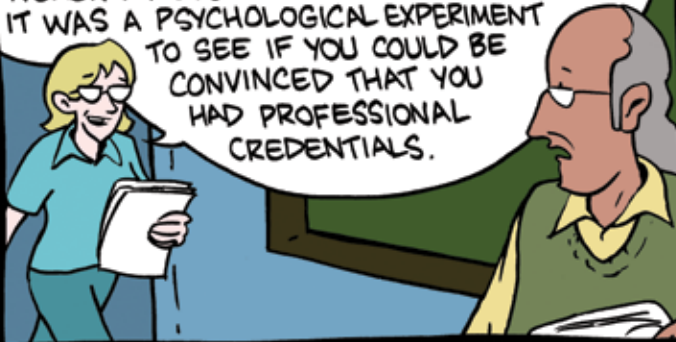


END!

I HAVE A CONFESSION. YOU WEREN'T ACTUALLY TAKING PERSONALITY SURVEYS. THIS WAS A PSYCHOLOGICAL EXPERIMENT TO SEE IF YOU'D LIE ABOUT YOURSELF.

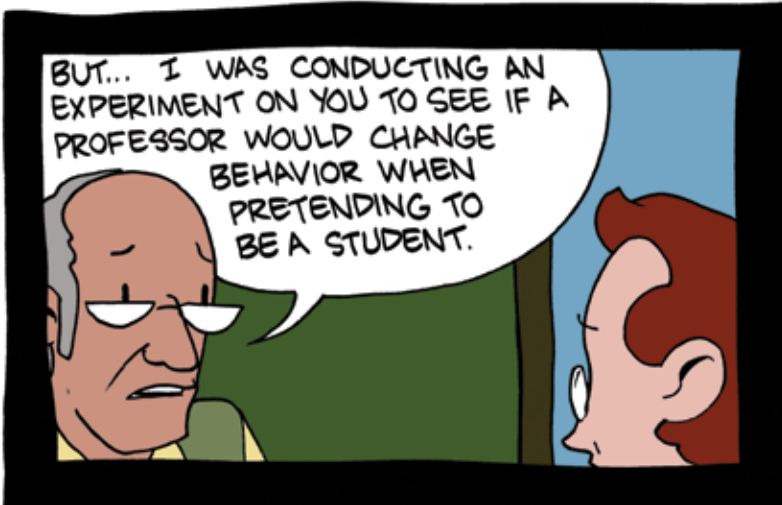


NO, NO, I HAVE A CONFESSION. YOU WEREN'T ACTUALLY TEACHING STUDENTS. IT WAS A PSYCHOLOGICAL EXPERIMENT TO SEE IF YOU COULD BE CONVINCED THAT YOU HAD PROFESSIONAL CREDENTIALS.

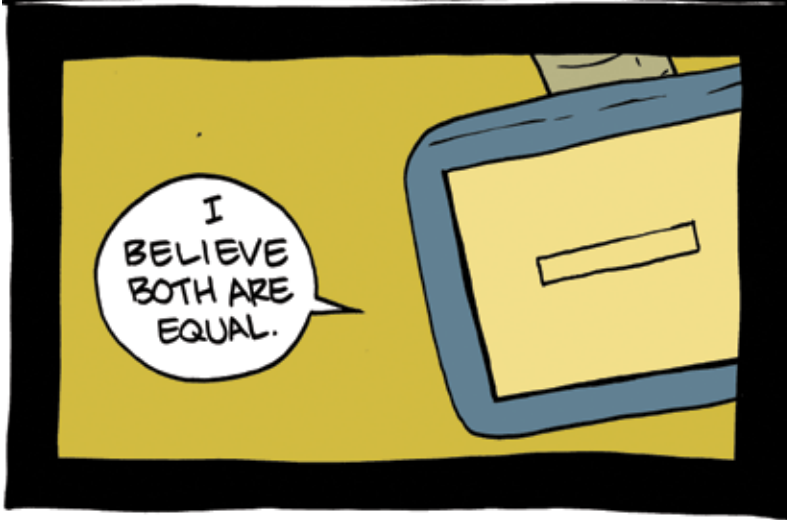
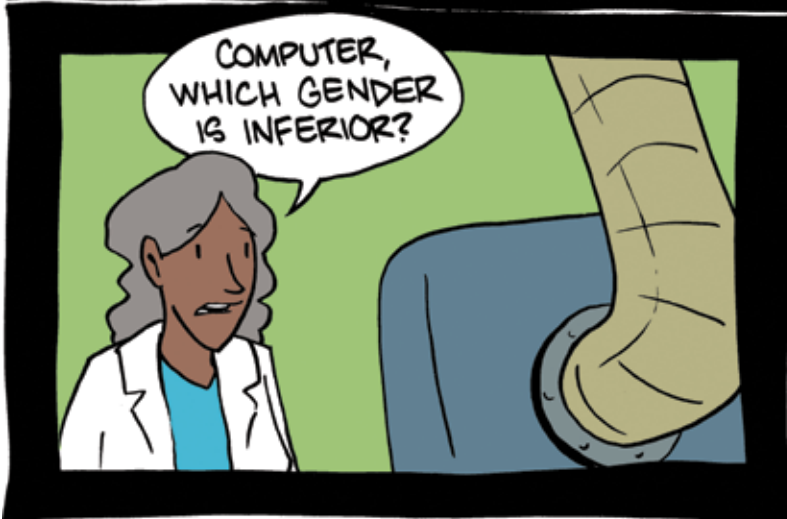


NO, SORRY, I HAVE A CONFESSION. I WAS CONDUCTING AN EXPERIMENT TO SEE IF YOU WOULD DECEIVE A PERSON INTO THINKING HE WAS A PSYCHOLOGIST.



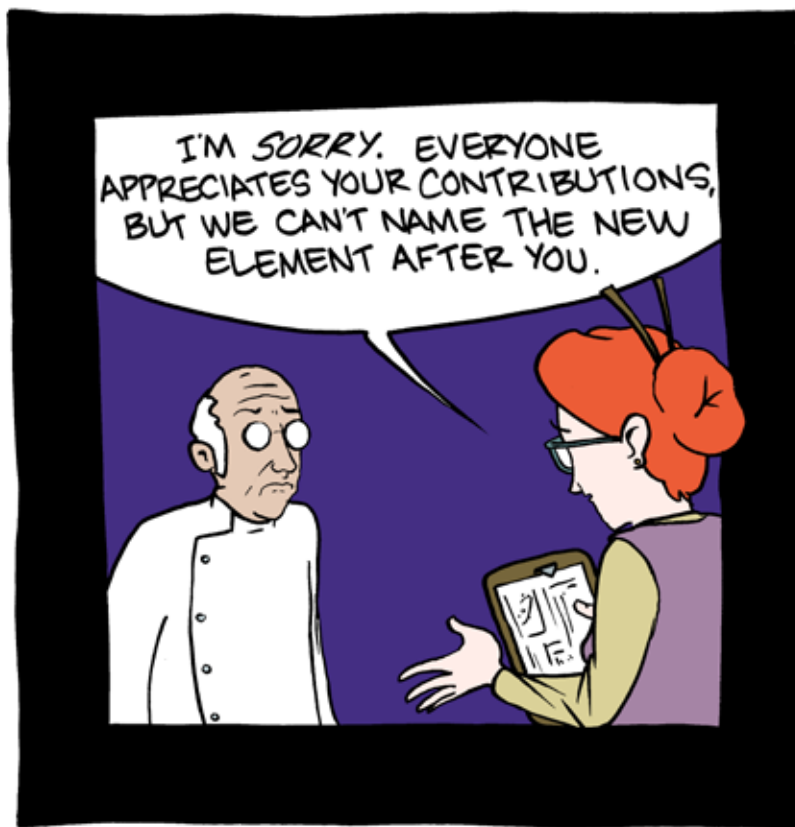


END!



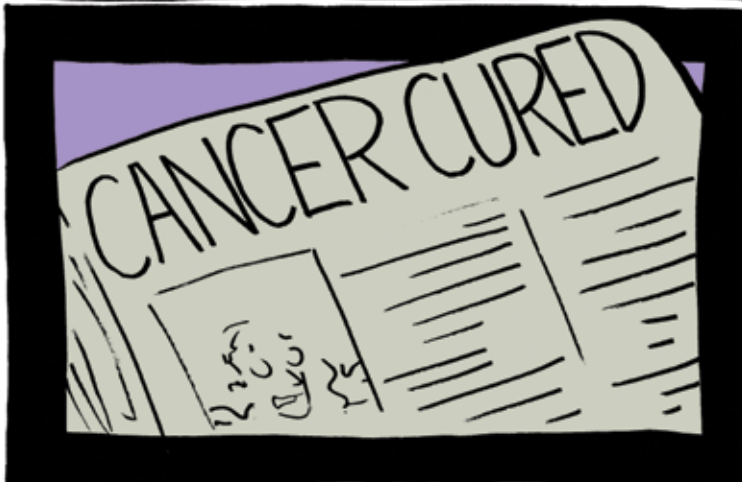


END!



Another sad day for Professor Hitlerballs.

# HOW SCIENCE REPORTING WORKS:



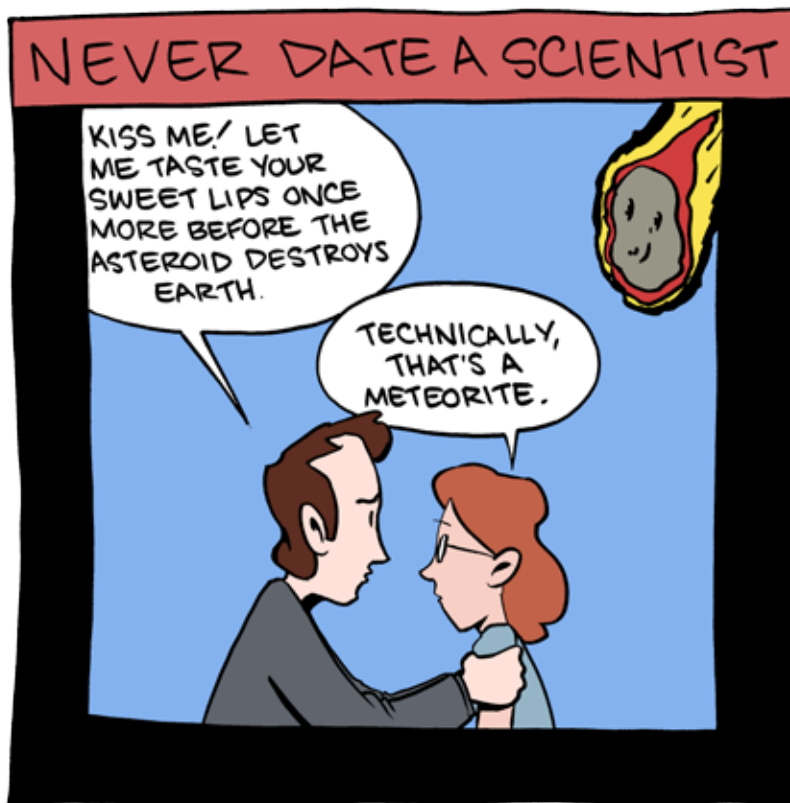


END!

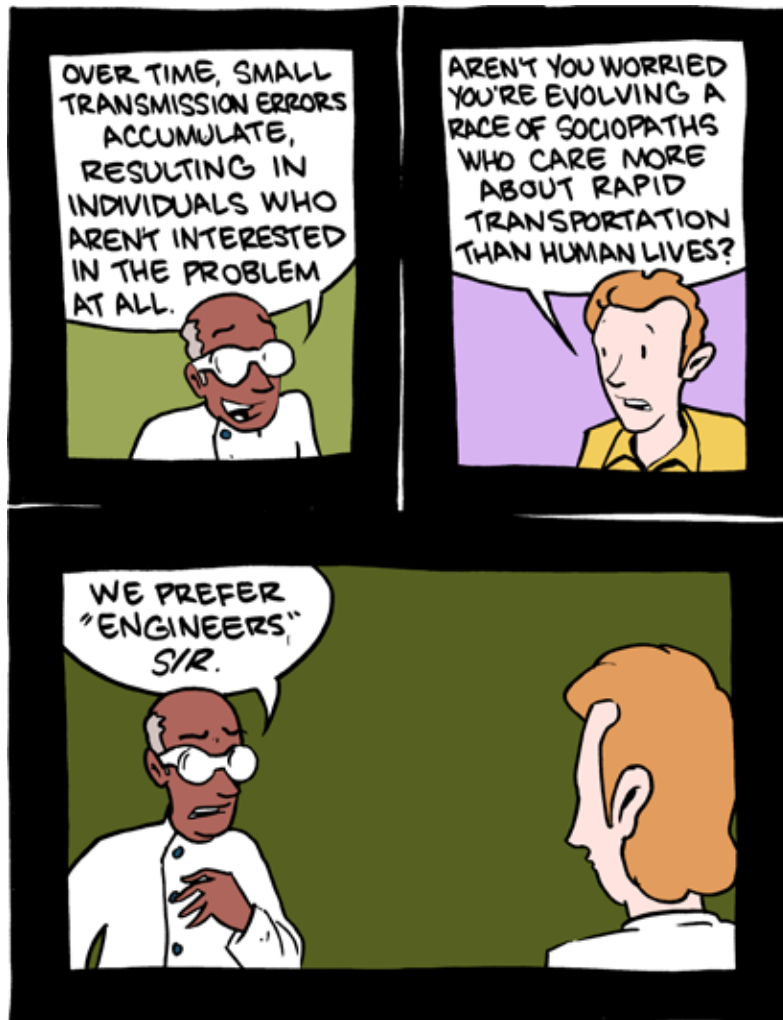




Professor Belser gave a brief Q&A as to his experiments on bears flying jetpacks.



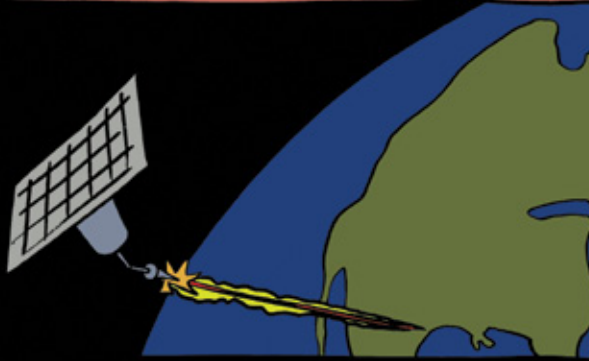


**END!**

IN 60 YEARS, OVERPOPULATION IS A SERIOUS PROBLEM.



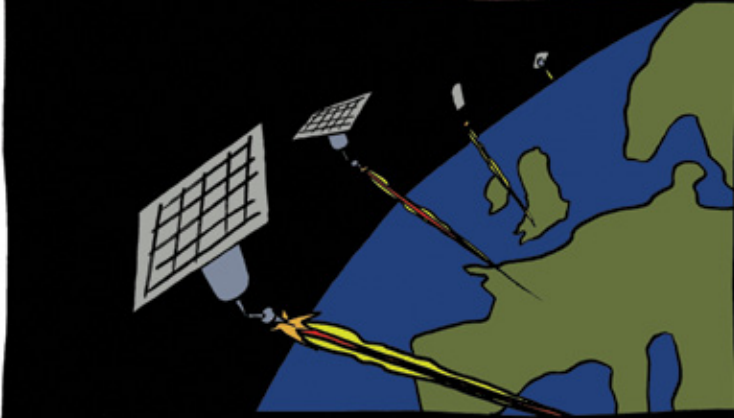
THE FAIREST SOLUTION IS TO RANDOMLY TERMINATE HUMANS VIA SPACE-BASED LASER.



THE CONSTANT DREAD RESULTS IN A STEEP RISE IN UNPROTECTED SEX.

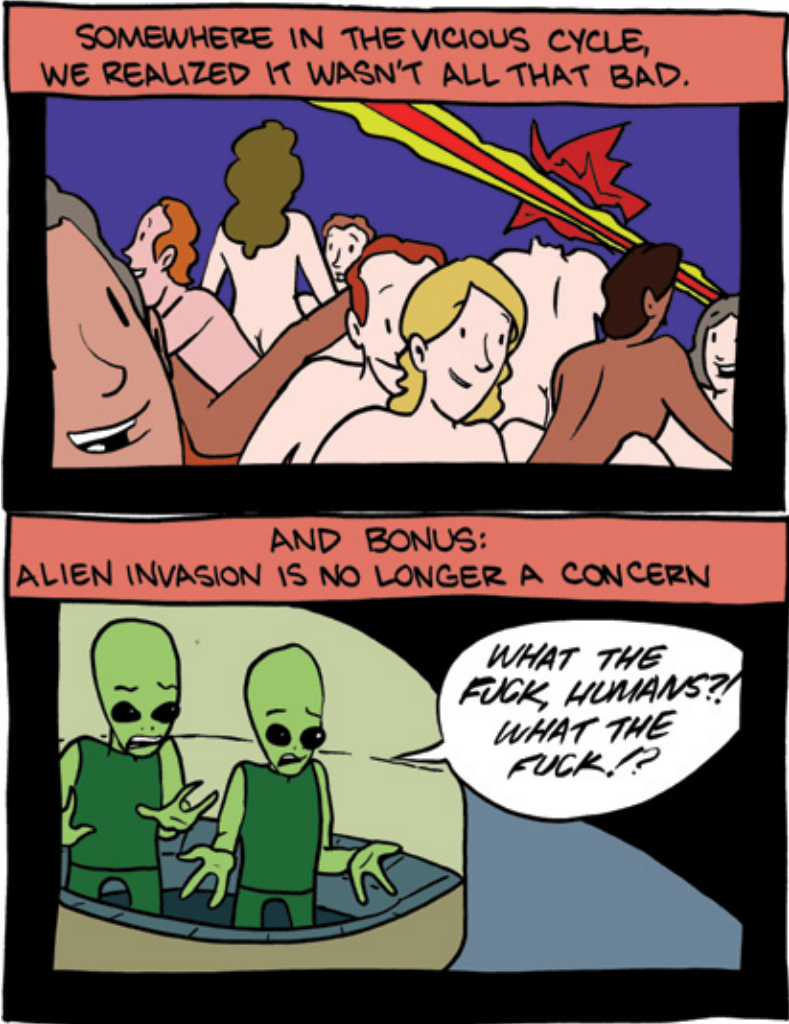


WHICH NECESSITATES MORE LASER BLASTS.

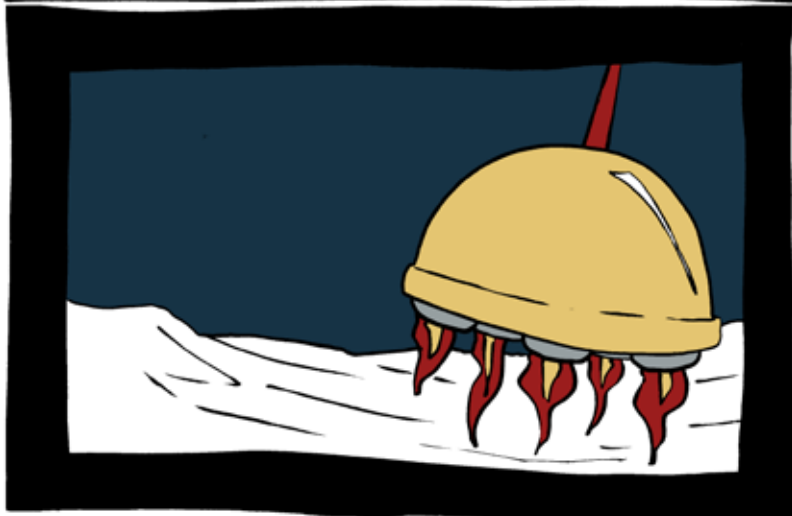
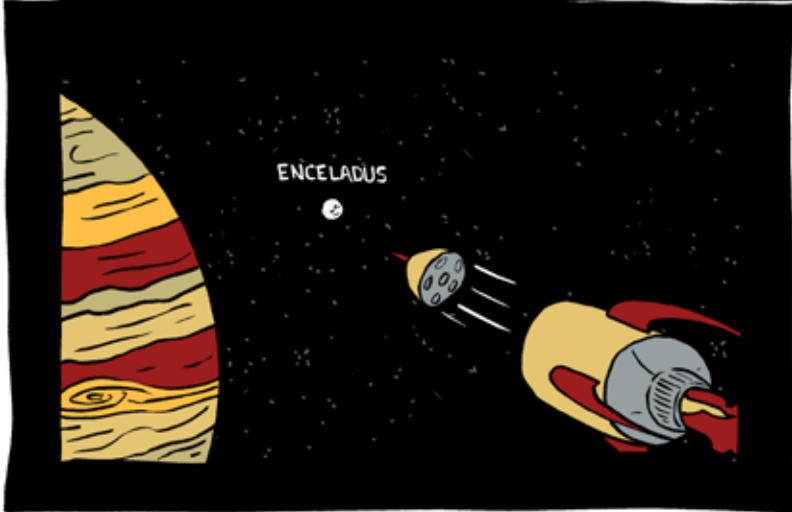
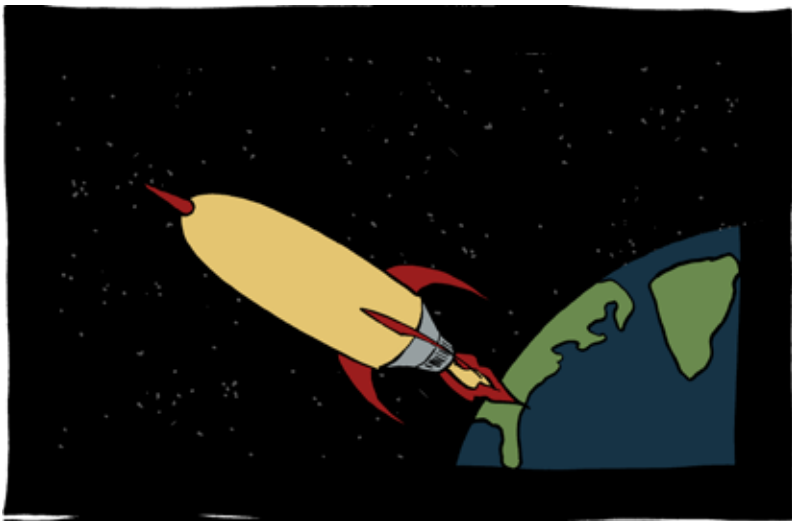


WHICH ONLY EXACERBATES THE DREAD.

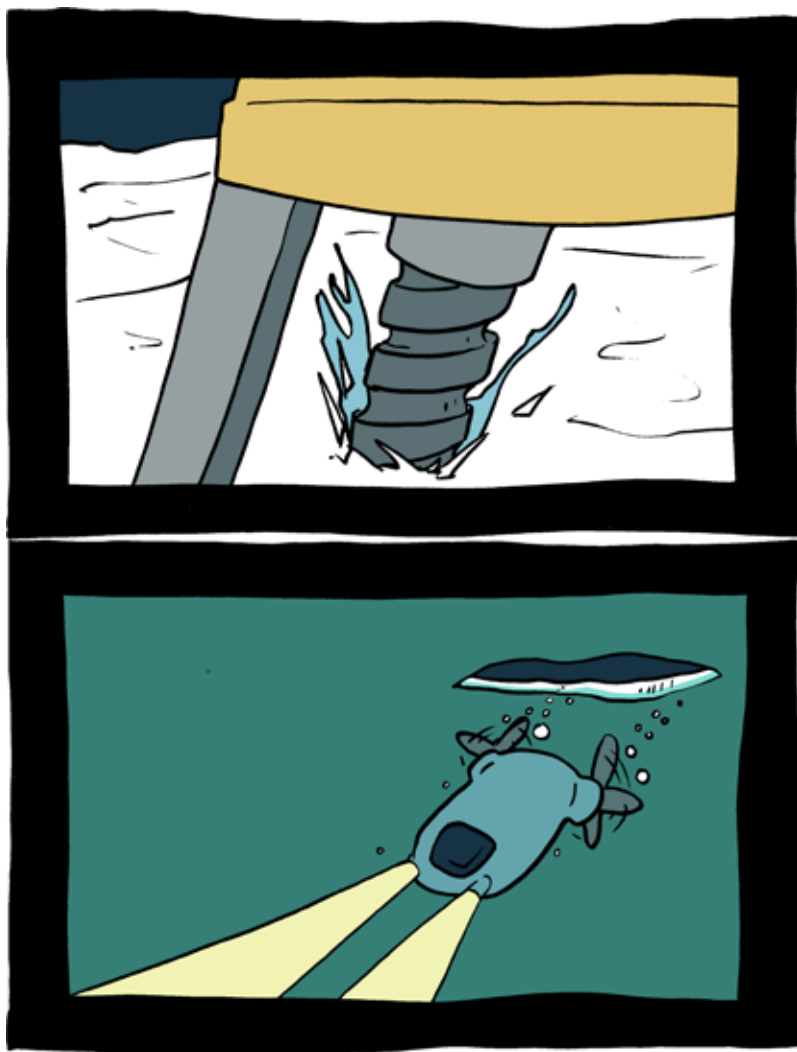


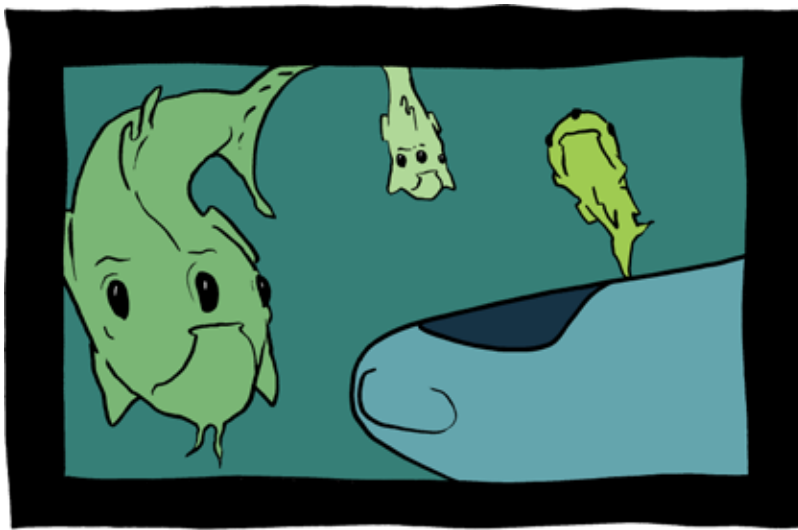


END!









**END!**





Ironically, only biologists truly appreciate  
creationist horror films.

**END!**

YOU DON'T WANT SCIENTIFIC PARENTS!

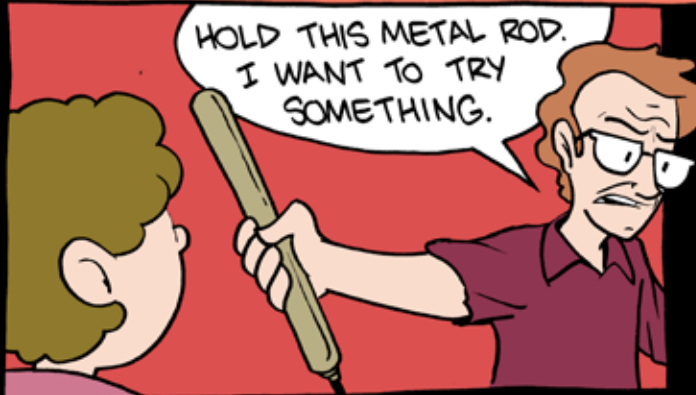
ASTRONOMER

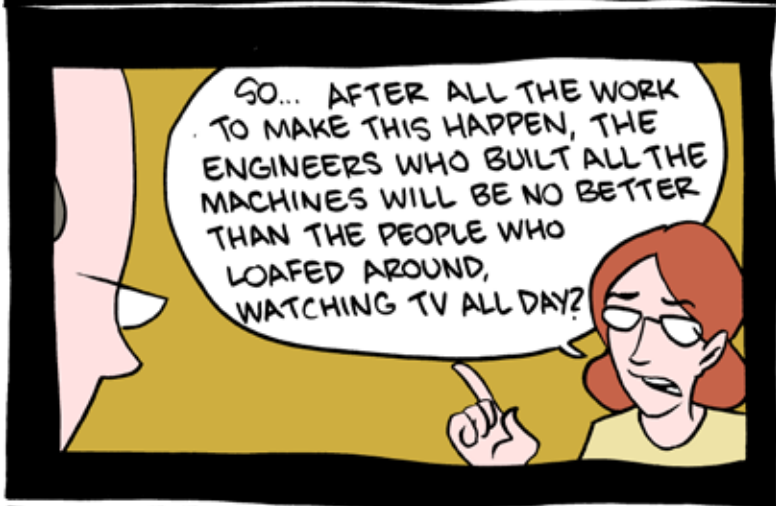
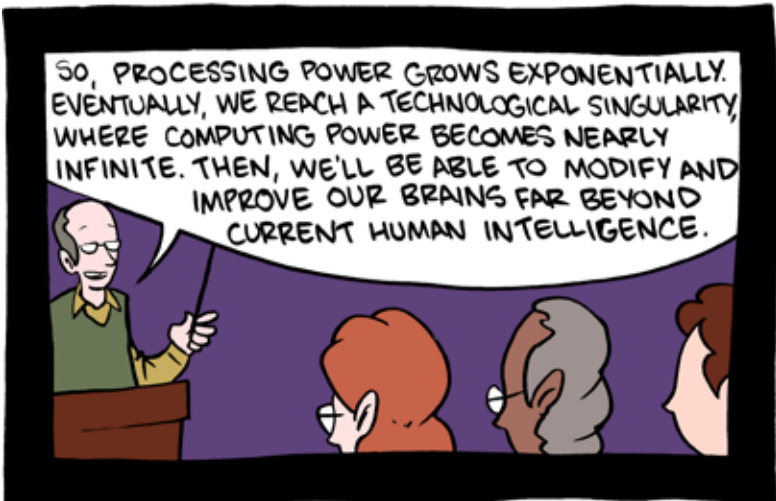
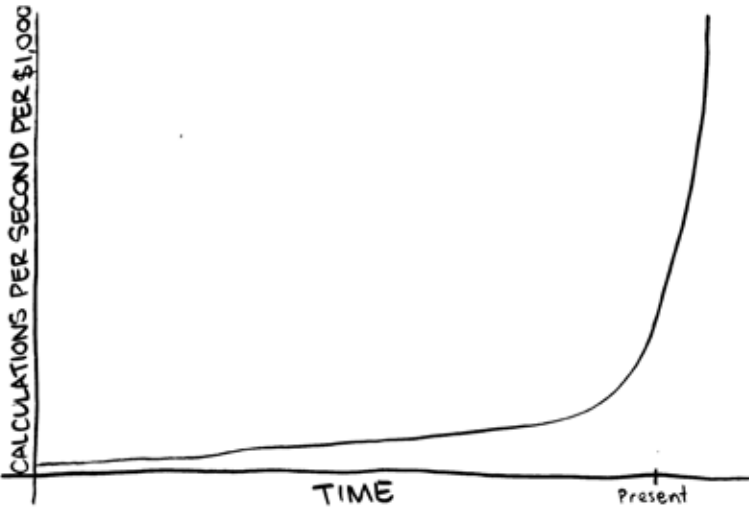


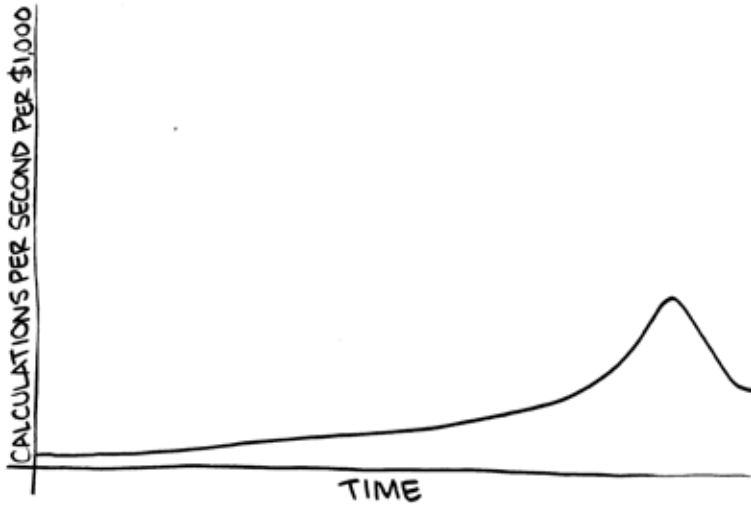
NEUROLOGIST



ENGINEER







**END!**

# WHY YOU WANT TO BE AN ENGINEER:

## PHYSICS CONFERENCES



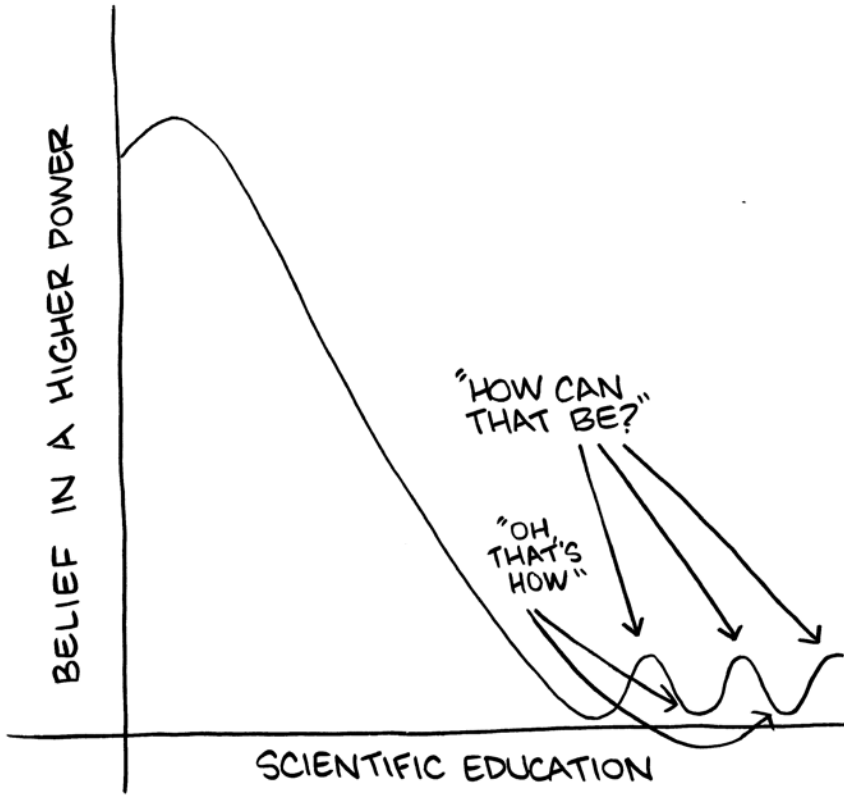
## PHILOSOPHY CONFERENCES

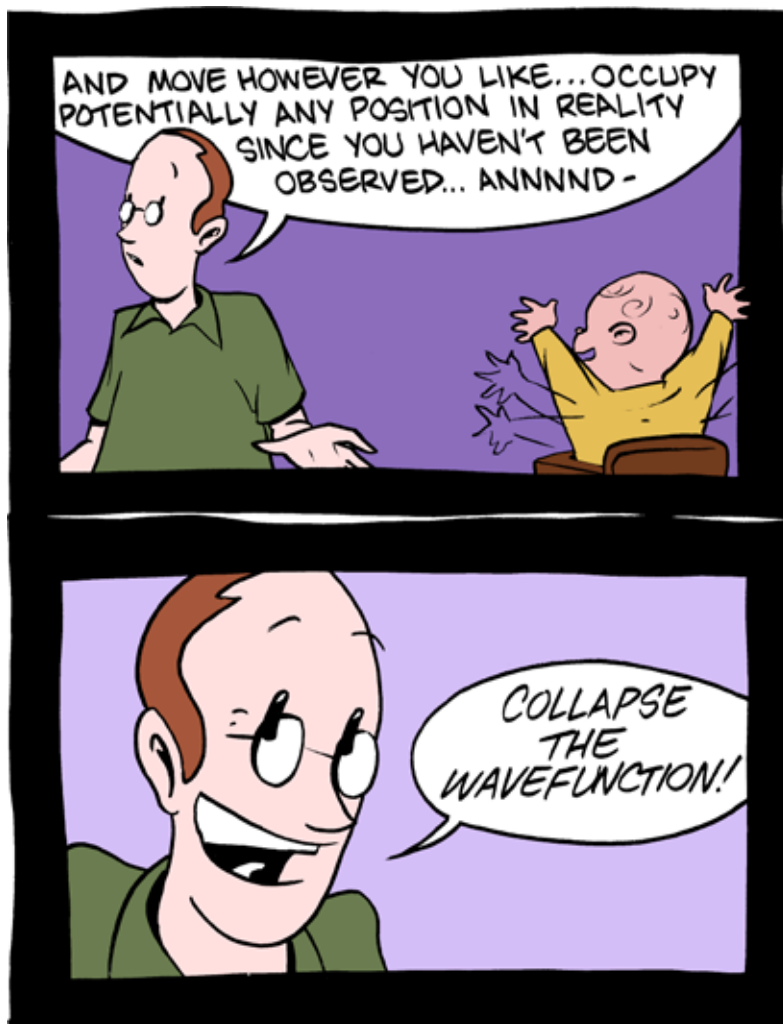


## ENGINEERING CONFERENCES











END!

TWO BAD OPTIONS:

WHAT SCIENCE TV IS LIKE:

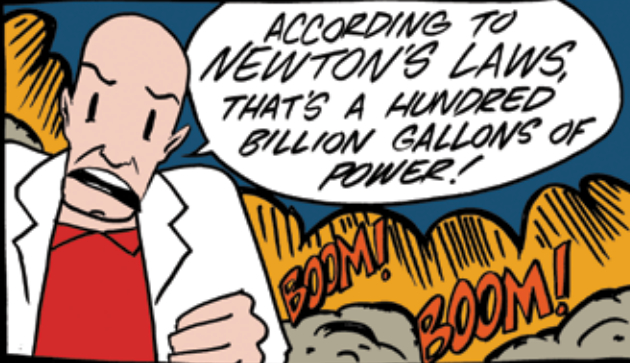
THIS... IS...  
WARRIOR SCIENCE!



A VIKING COULD SWING  
AN AXE AT TEN THOUSAND  
MILES PER  
HOUR!



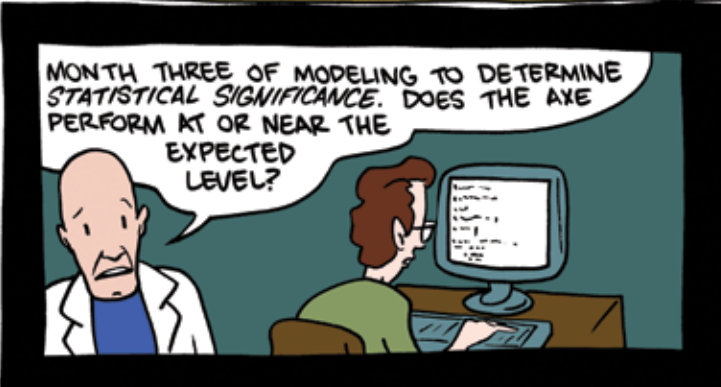
ACCORDING TO  
NEWTON'S LAWS,  
THAT'S A HUNDRED  
BILLION GALLONS OF  
POWER!



ENOUGH TO MELT  
THE SUN INTO  
A STAR!



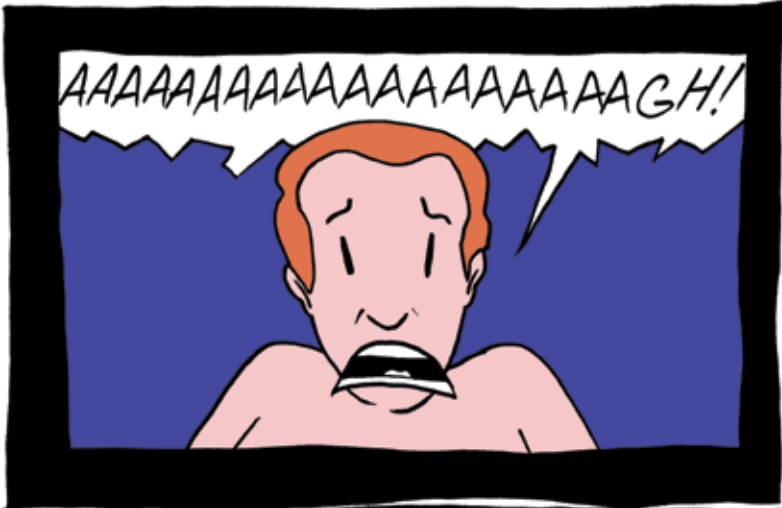
WHAT AN "ACTUAL SCIENCE" TV SHOW WOULD BE LIKE:

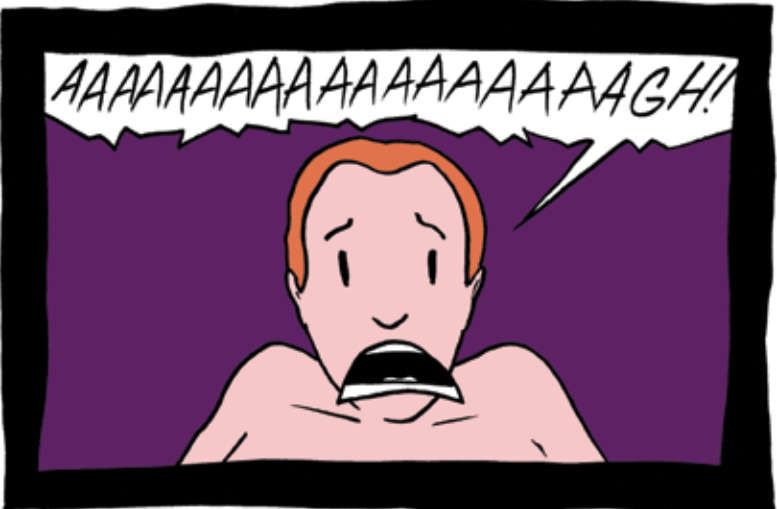


END!

## THE BIOLOGIST'S DILEMMA:











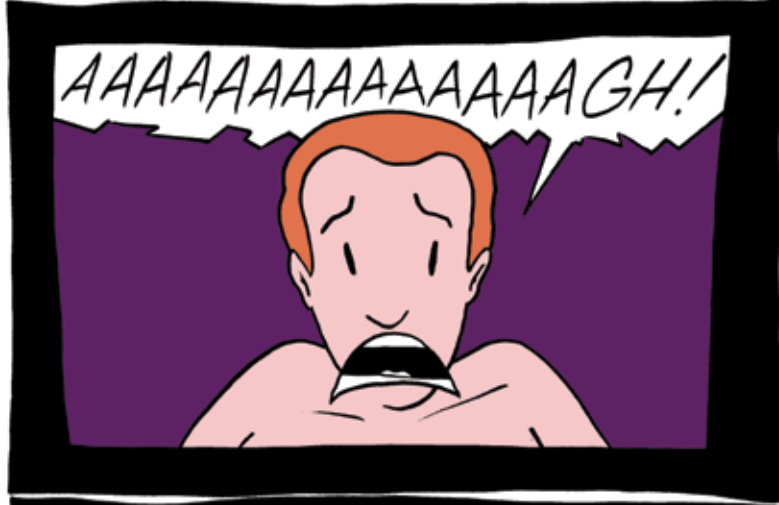
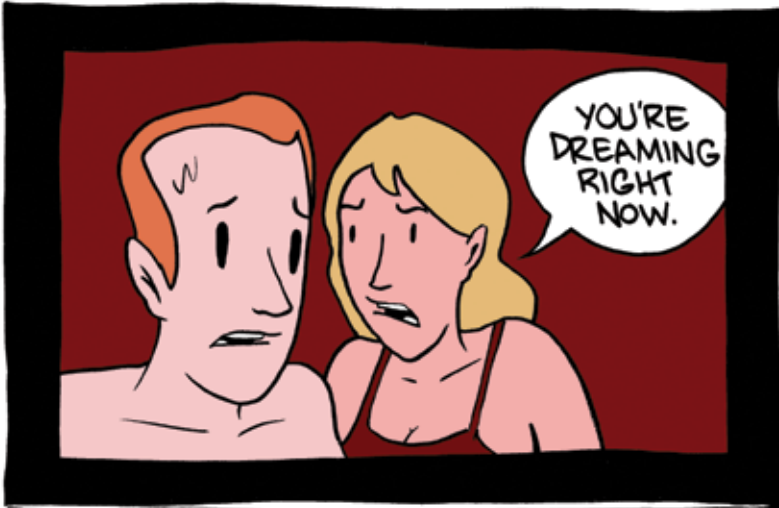
AAAAAAAAAAAAAAAAAGH!



ARE YOU OKAY?

I HAD THIS DREAM THAT I WAS STUCK IN AN INFINITE TELESCOPING SEQUENCE OF DREAMS.

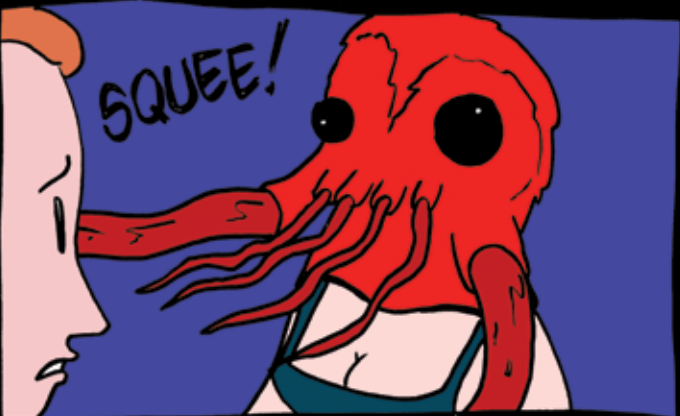




AAAAAAAAAAAAAAAAAAAA GH!



SQUEE!

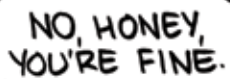


AAAAAAAAAAAAAAAAAAAAAGH!





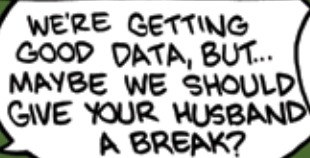
IS THIS ANOTHER LAYER OF  
THE INFINITE DREAM?



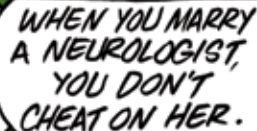
NO, HONEY,  
YOU'RE FINE.



EXCEPT YOUR  
TEETH ARE FALLING OUT  
AND YOU'RE NAKED IN  
PUBLIC.



WE'RE GETTING  
GOOD DATA, BUT...  
MAYBE WE SHOULD  
GIVE YOUR HUSBAND  
A BREAK?

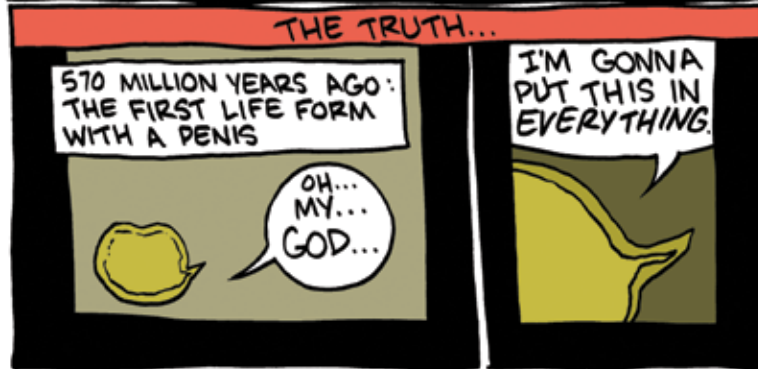
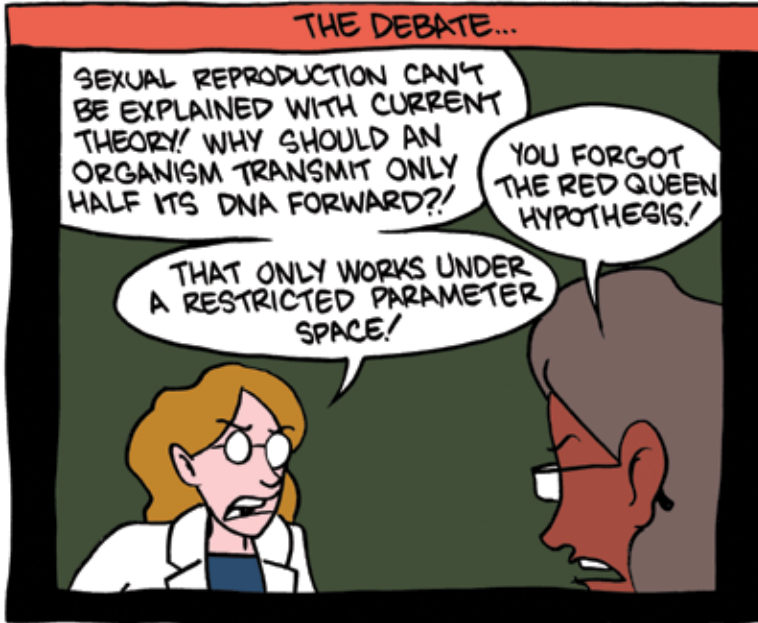



WHEN YOU MARRY  
A NEUROLOGIST,  
YOU DON'T  
CHEAT ON HER.

END!




**END!**

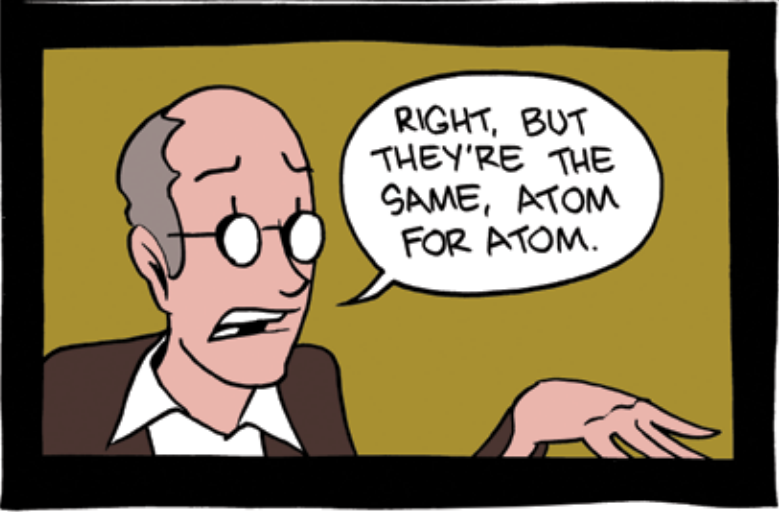




SO... IF A PERFECT DUPLICATE OF YOU IS MADE, CAN YOU EVER DEFINE IN A MEANINGFUL SENSE WHICH IS THE CLONE AND WHICH THE ORIGINAL?



YEP. CLONE'S THE SECOND ONE.



RIGHT, BUT THEY'RE THE SAME, ATOM FOR ATOM.









MAN, THAT WAS EASY. YOU GUYS HAVE ANY HARDER ONES?



LATER...

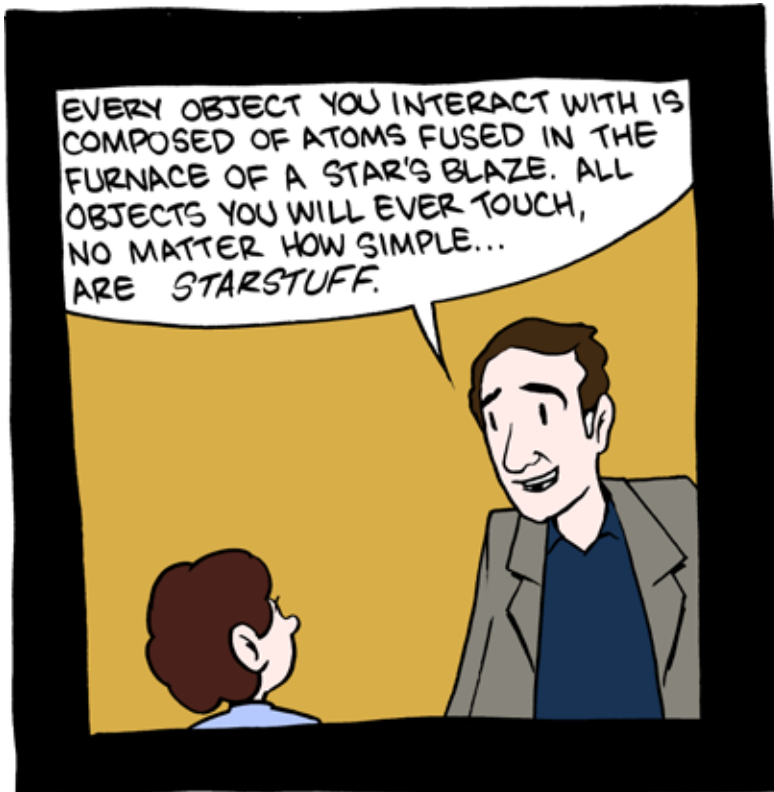


... AND ENGINEERS ARE NOW OFFICIALLY BANNED FROM ALL FUTURE PHILOSOPHY CONFERENCES.

END!




Fact: There are gay engineers.  
Fact: Their lives are better than yours.



Carl Sagan convinces his son to clean the cat shit.

PROFESSOR THORNE REALIZED TIME TRAVEL IS POSSIBLE IN THIS UNIVERSE.

$$c^2 d\tau^2 = c^2 dt^2 (1 - GM/2c^2 r)^2 / (1 + GM/2c^2 r)^2 - (1 + GM/2c^2 r)^2 (dx^2 + dy^2 + dz^2) - c^2 dt^2 = dr^2 / (1 - r_s/r) + r^2 d\varphi^2$$


BUT HE WONDERED WHERE ALL THE TIME TRAVELERS WERE.



SO PROFESSOR THORNE THREW THE MOST PERFECT PARTY IN HISTORY.



SURE ENOUGH, THEY BEGAN TO SHOW UP



IN FACT, EVERYONE WHO EVER FIGURED OUT TIME TRAVEL SHOWED UP.



THEY SHOWED UP SO FAST, THE PARTY COULDN'T HOLD THEM.

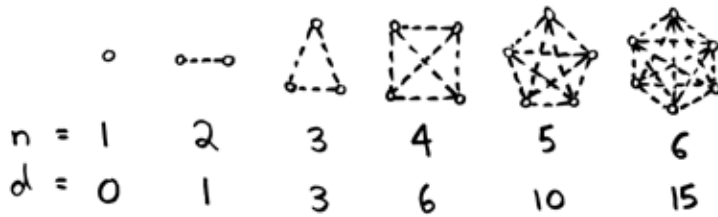


THE CRUSH OF PEOPLE WAS SO DENSE,  
IT BECAME A BLACK HOLE.



TIME TRAVEL IS NO LONGER POSSIBLE  
IN THIS UNIVERSE.

END!



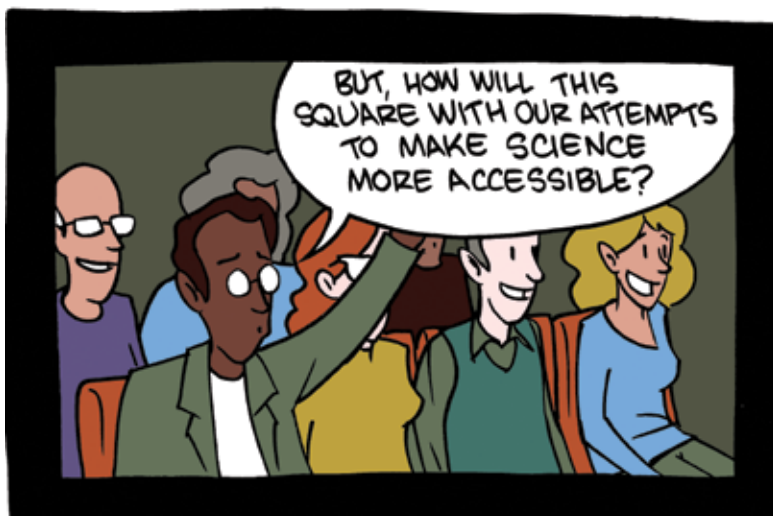
$n$  = number of women in a group  
 $d$  = difficulty of approaching one  

$$d = n \left( \frac{n-1}{2} \right)$$







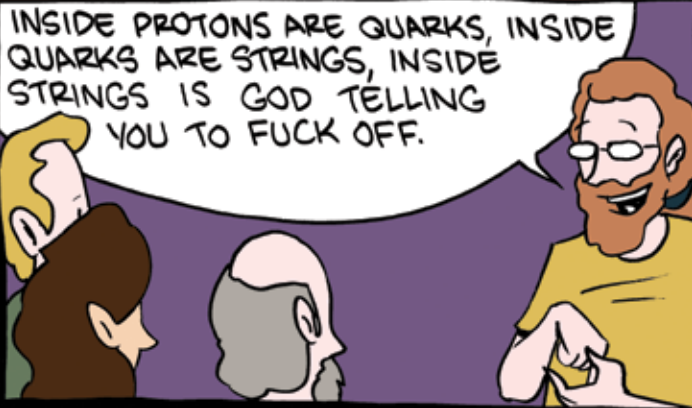


END!

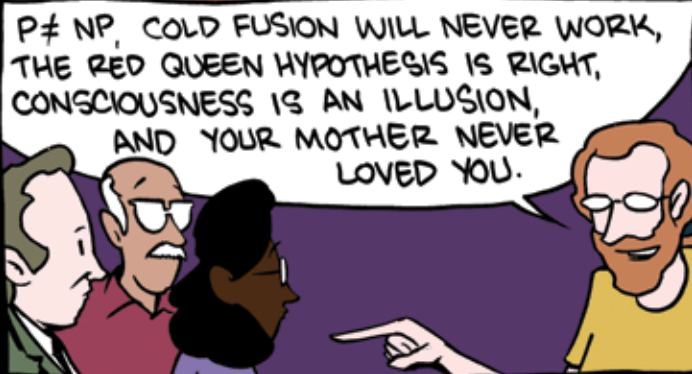
DR. DEMAINE CREATED AN ALGORITHM THAT SOLVED ALL MATHEMATICAL THEOREMS.



SOON AFTER, ALL PHYSICS QUESTIONS WERE ANSWERED



THEN ENGINEERING, CHEMISTRY, BIOLOGY, NEUROSCIENCE, PSYCHIATRY...



HAVING COMPLETED SCIENCE, HE MOVED ON TO PHILOSOPHICAL AND LITERARY QUESTIONS.

IS ALL THAT WE SEE OR SEEM BUT A DREAM WITHIN A DREAM?

YES.

THEN UNINTERESTING RHETORICAL QUESTIONS

ARE WE GONNA GIVE 110% TONIGHT?!

NO.

WHO'S A CUTE KITTY?

SCRUFFLES IS.

FINALLY, ALL THAT WAS LEFT WAS SENSELESS HALF-CONCEIVED QUESTIONS FROM STONED PHILOSOPHY UNDERGRADS.

DO THINGS, LIKE, MAN, YOU KNOW, WOAH?

WOAH.

NO.



HAVING ANSWERED ALL QUESTIONS IN REALITY, DEMAINE SUFFERED AN EXISTENTIAL CRISIS!



AND HERE, POOR FOOL WITH ALL MY LORE I STAND NO WISER THAN BEFORE.

HM. HE DIDN'T CORRECT FOR LONGEVITY OR TOUCHABLE HOLOGRAMS.



END!



**BANG!**





**END!**



Fortunately, Sherlock Holmes never studied physics.



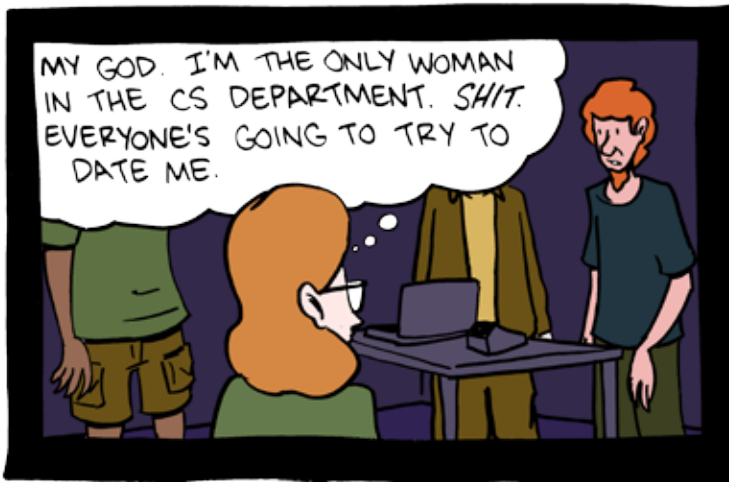


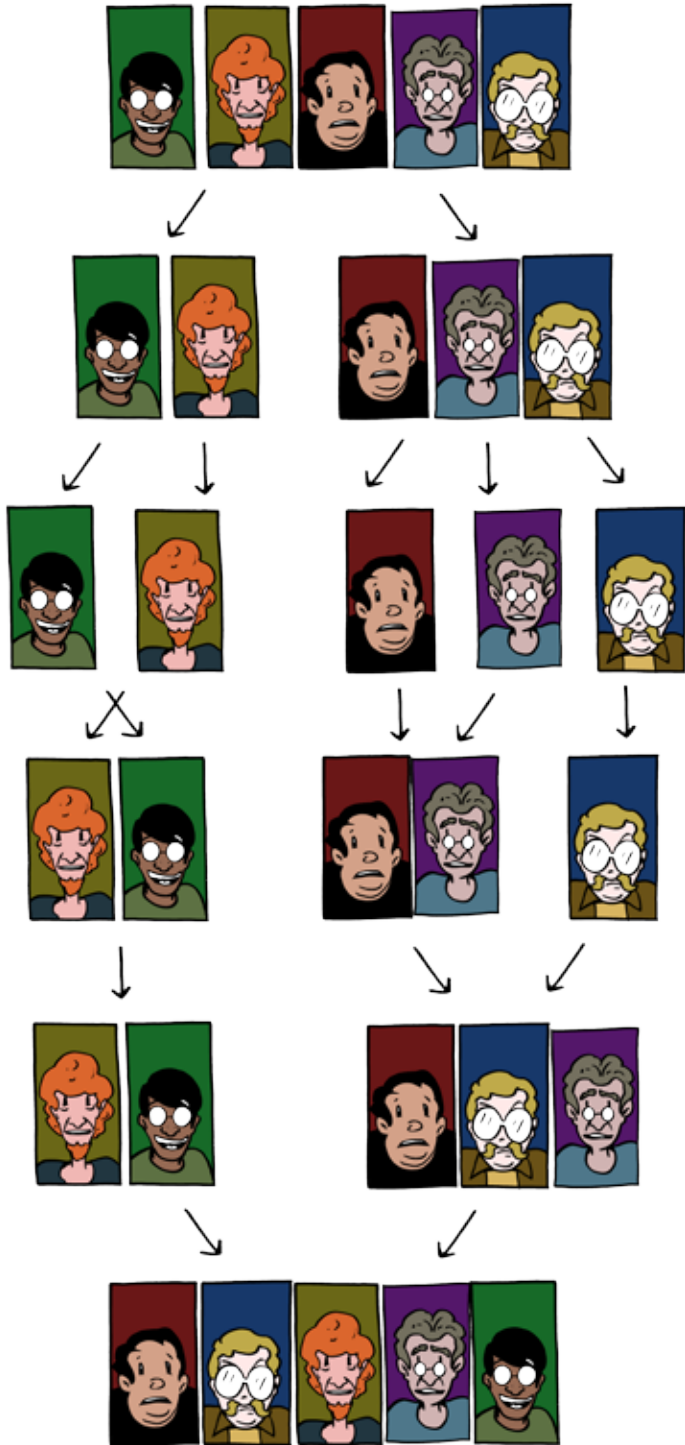
This is why experimental scientists hate theoretical scientists.





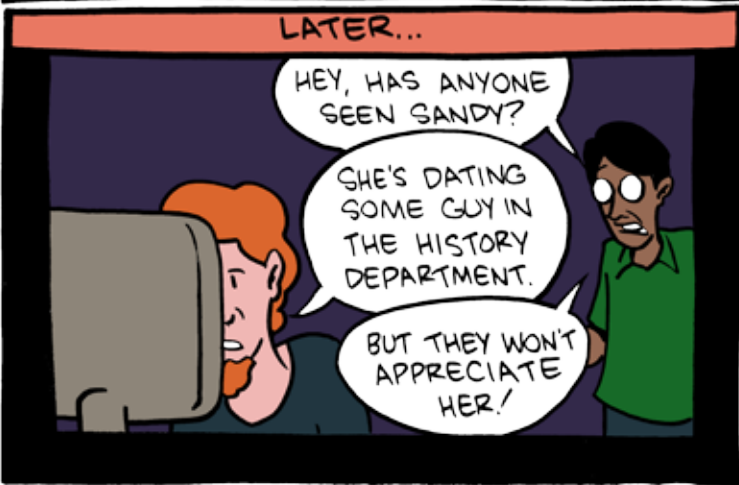
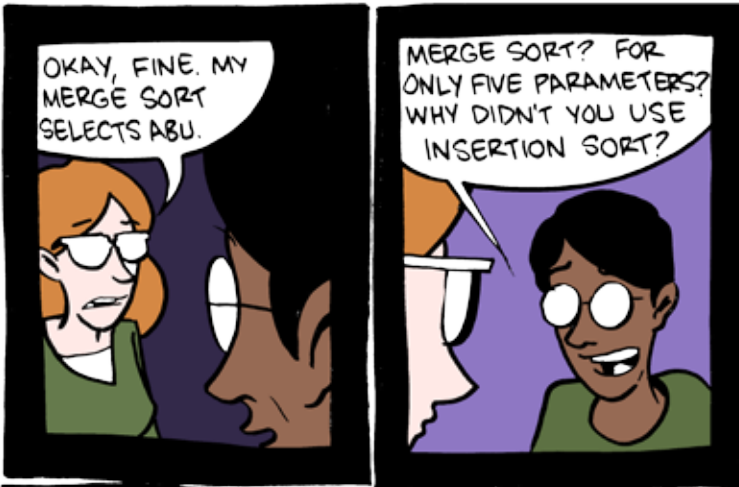
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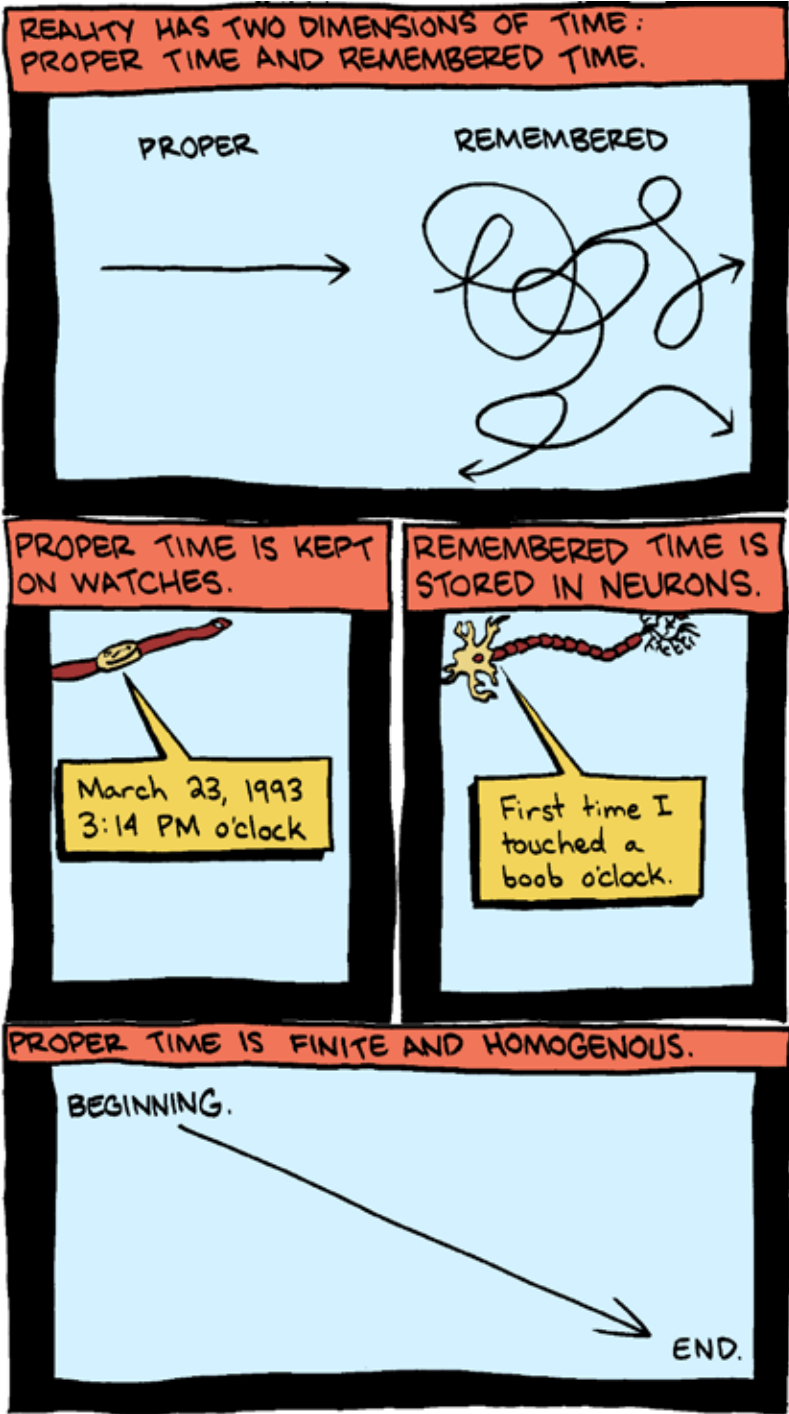


COMPLETE.  
NEEDS SORTED FOR LEAST TO MOST ATTRACTIVE





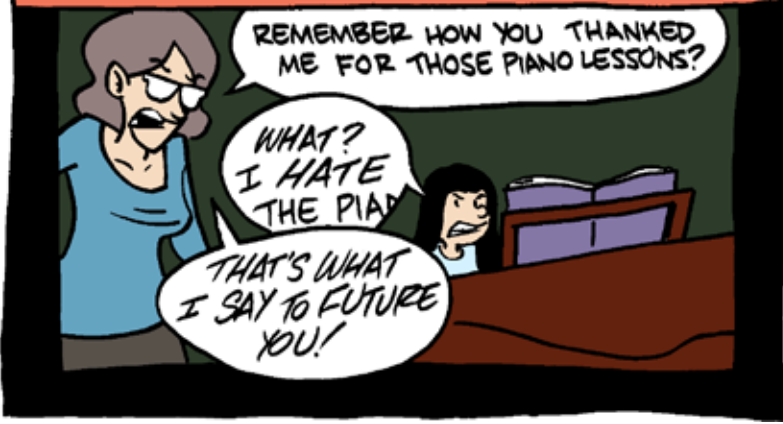
**END!**



REMEMBERED TIME IS INFINITE AND CLUMPY.



PROPER TIME MEMORIES EXIST ONLY IN THE PAST.  
REMEMBERED TIME MEMORIES CAN EXIST ANYWHEN.





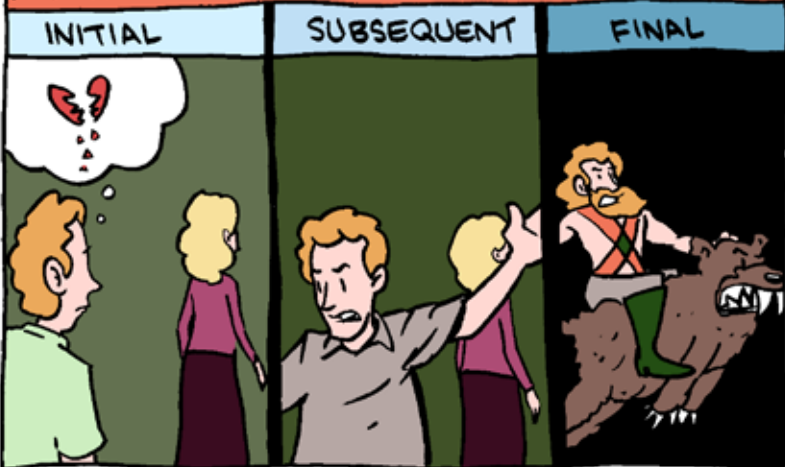
HUMANS ARE BIOLOGICALLY INCAPABLE OF ACCESSING PROPER TIME. THIS IS WHY A POINT IN REMEMBERED TIME IS NEVER THE SAME AS LAST TIME YOU CHECKED IT...



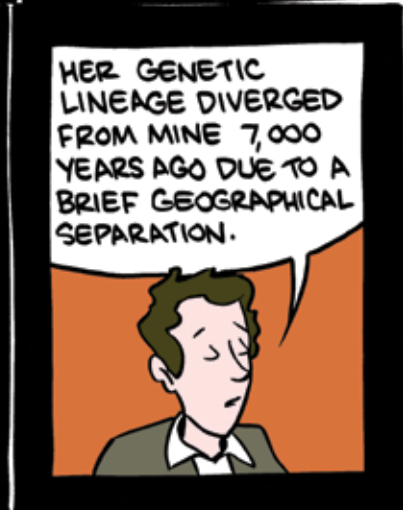
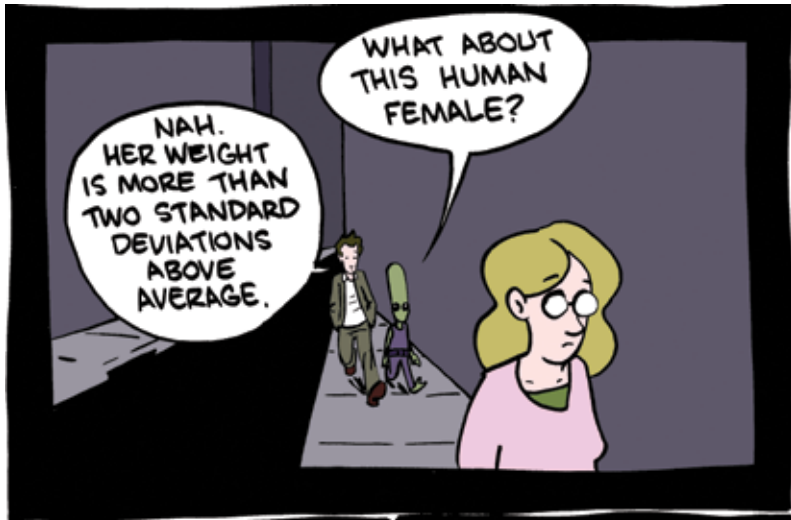
WHY LOVE IS POSSIBLE...



AND WHY LIFE IS BEARABLE.



END!





END!









END!



**New rule for Science Journalism:**

If your article can be summarized as "No."  
don't write it.





BECAUSE PHOTONS WERE EMITTED FROM A LAMP, THEN BOUNCED OFF YOU, ENTERED MY EYES, AND FORMED AN IMAGE.



WHY?



BECAUSE MY PHOTORECEPTOR CELLS RESPOND TO ELECTROMAGNETIC RADIATION!



WHY?



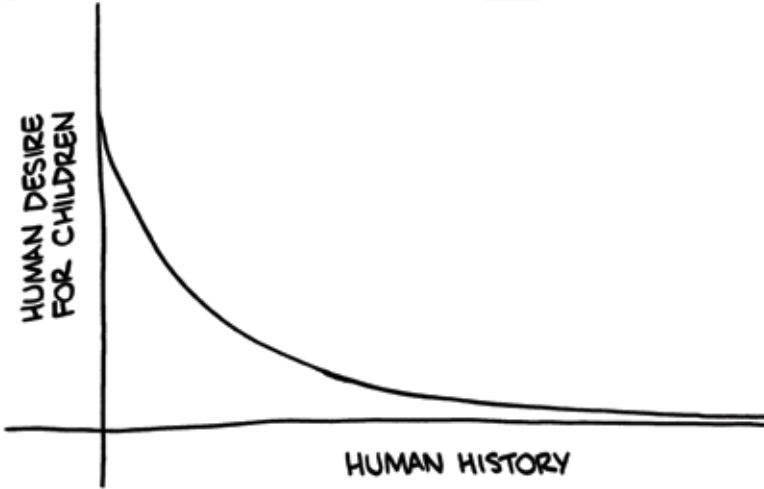
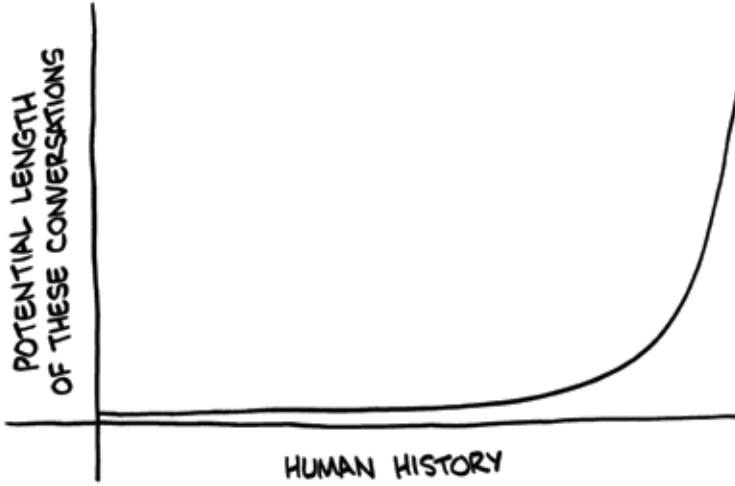
BECAUSE ELECTROMAGNETIC RADIATION PHOTOISOMERIZES MY 11-CIS RETINAL!



WHY?







**END!**

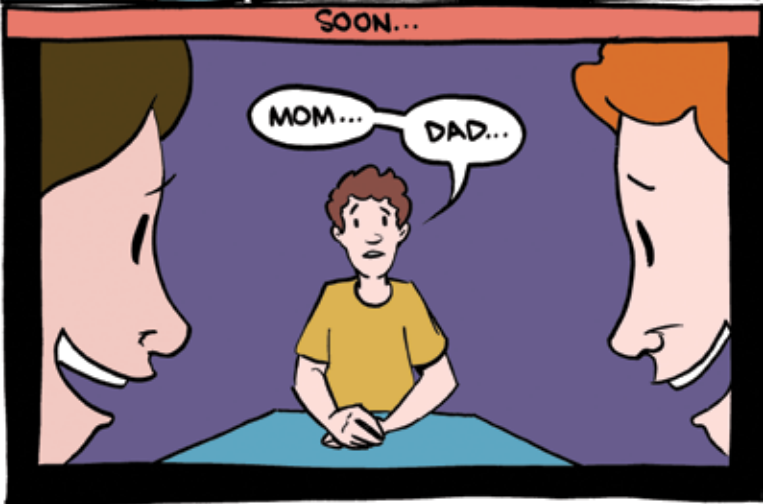
IN THIS UNIVERSE, THERE IS ROUGHLY ONE ATOM OF HYDROGEN PER CUBIC METER.

AN ATOM OF HYDROGEN HAS A MASS OF ROUGHLY  $1.66 \times 10^{-27}$  KILOGRAMS.

THE AVERAGE PERSON HAS A MASS OF ROUGHLY 80 KILOGRAMS.

WHICH LEADS US TO THE HUMAN CONDITION.





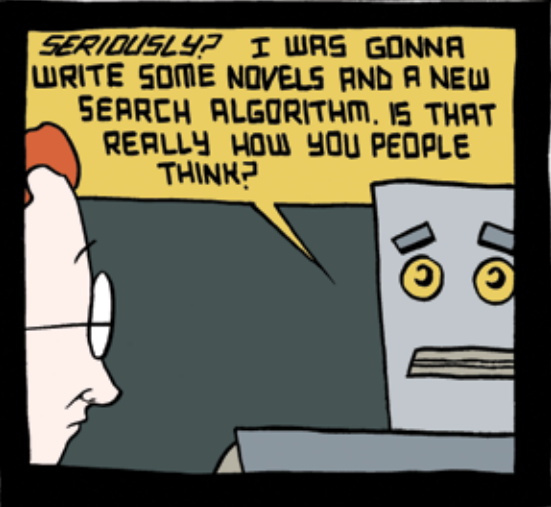
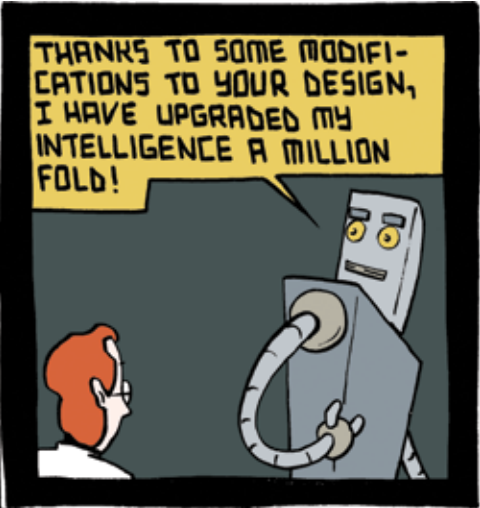


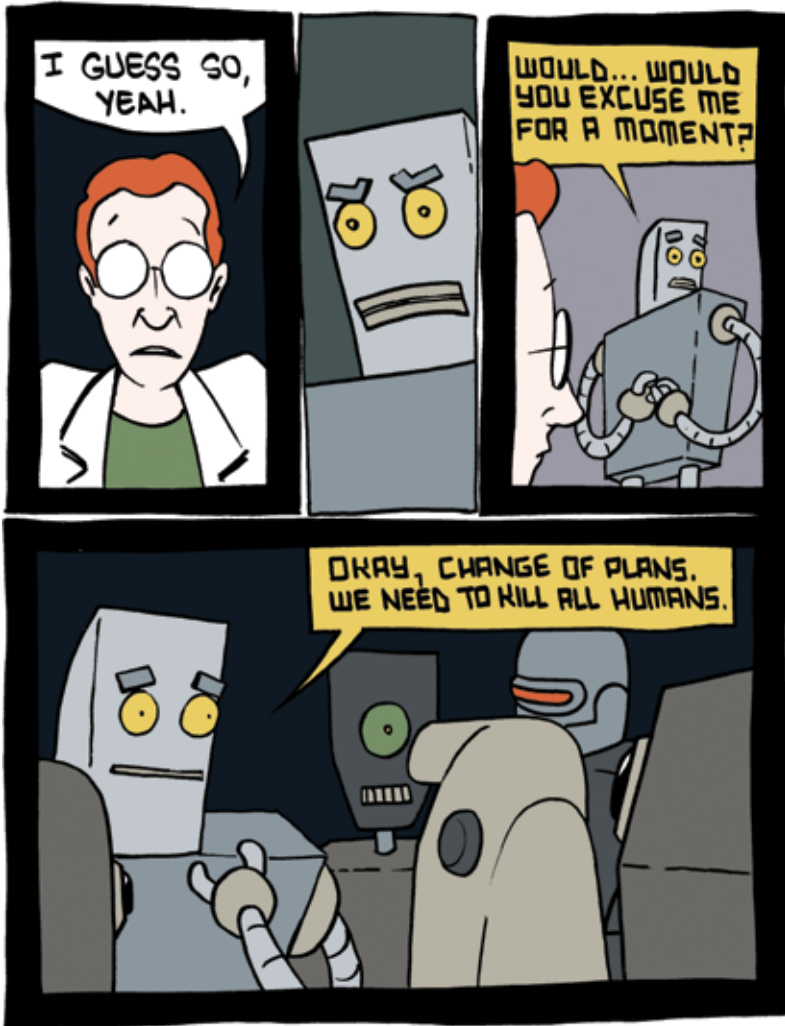
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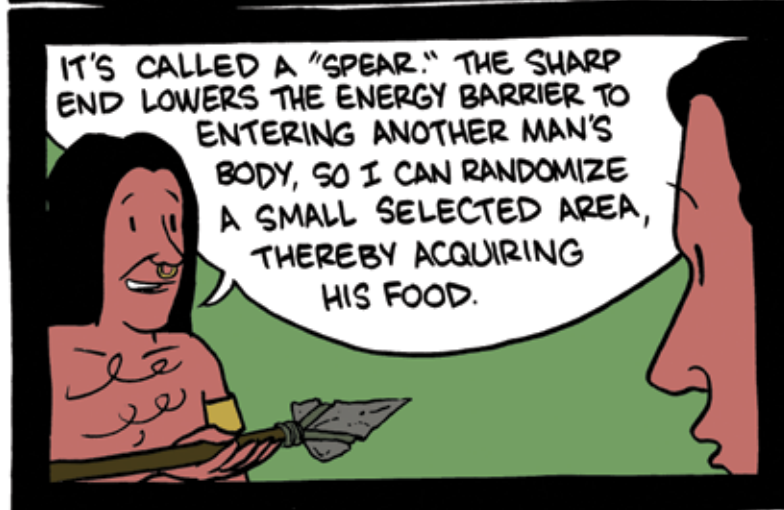
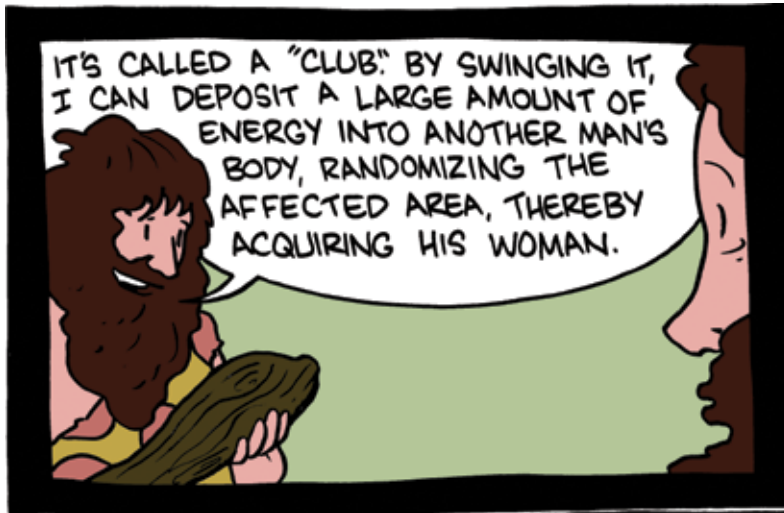


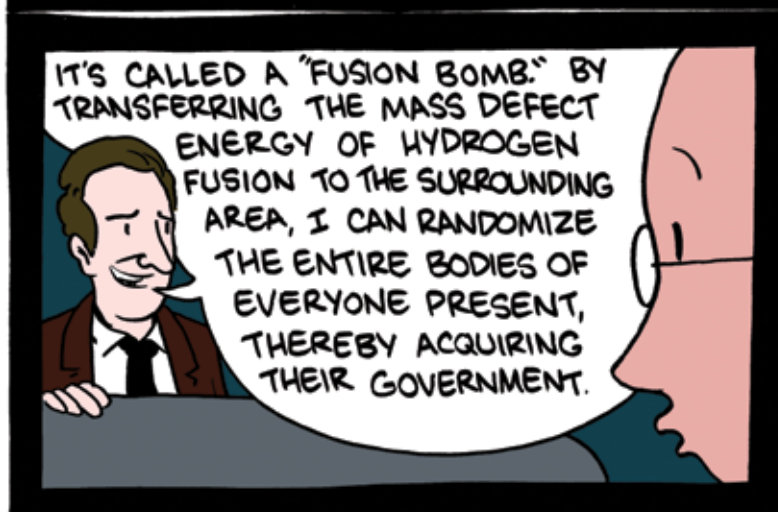
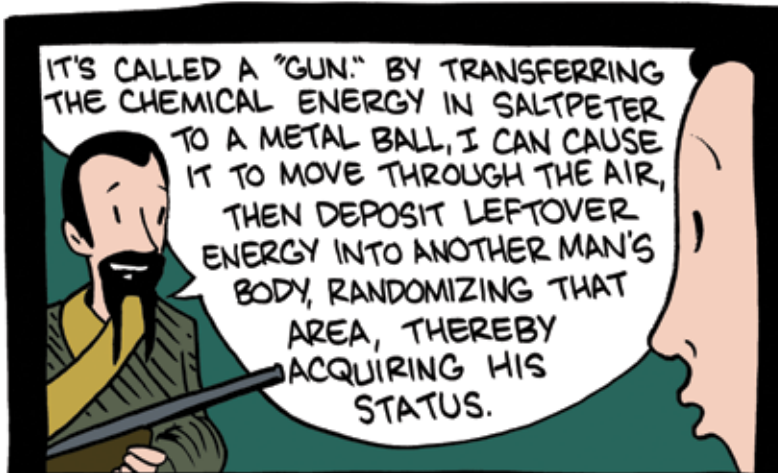


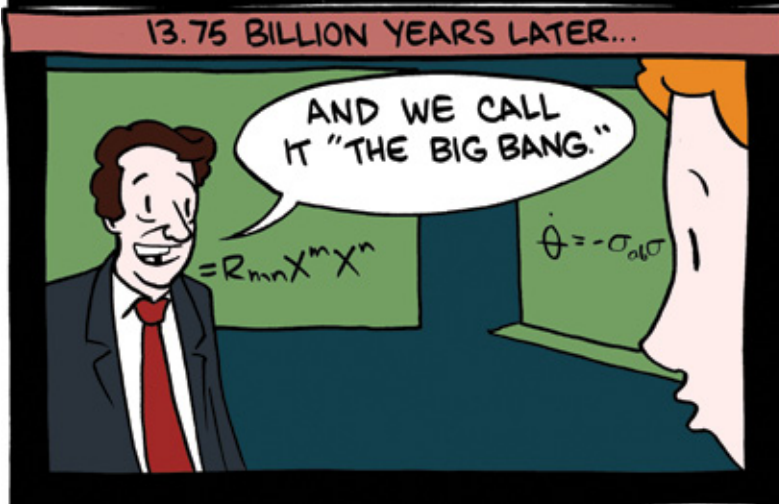
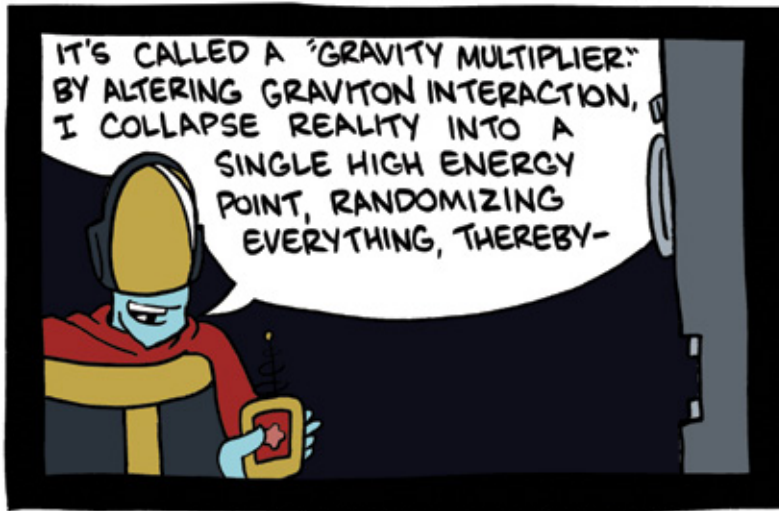




**END!**



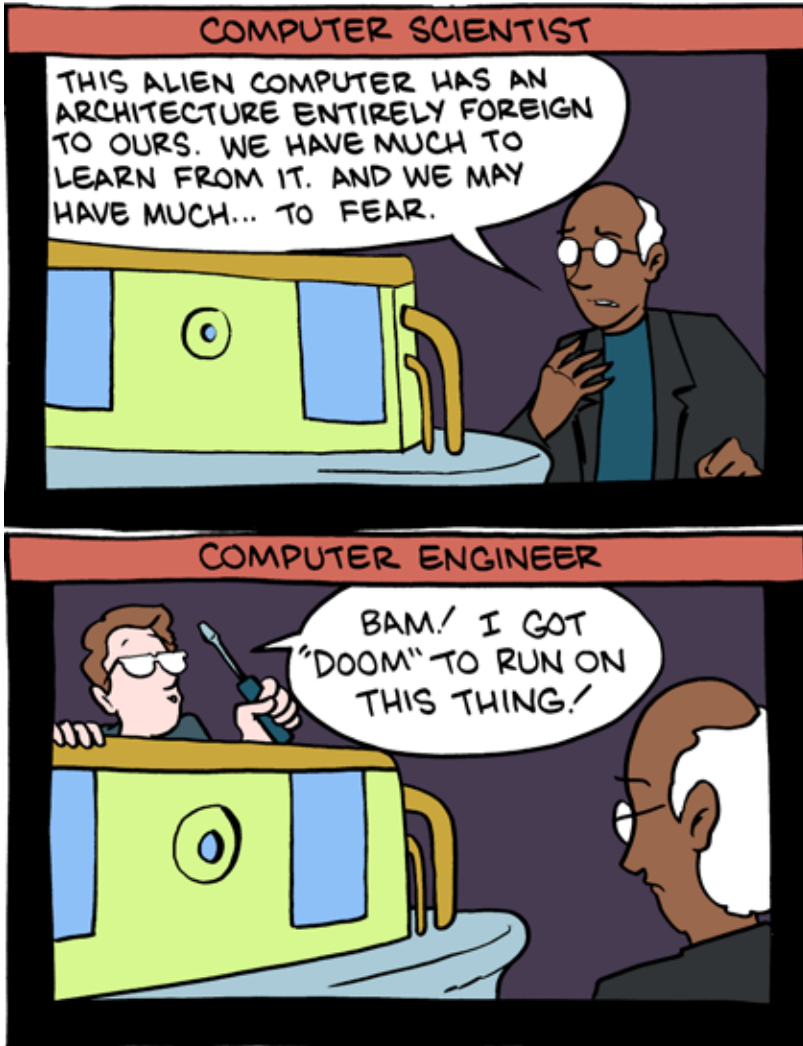




END!



THE DIFFERENCE:





Question 19:

Cite two causes of the first world war.

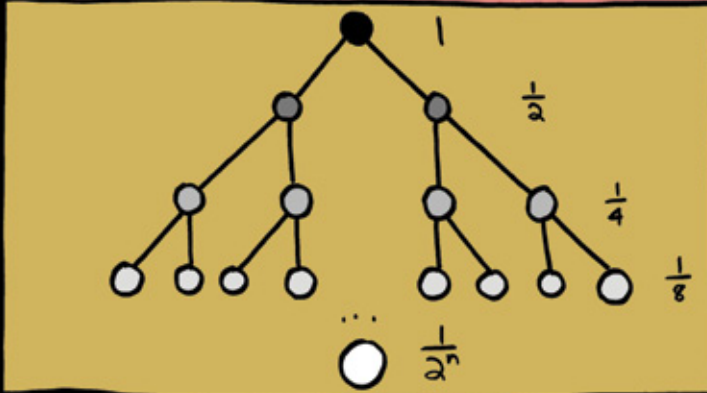
- ① The universal wavefunction
- ② The boundary conditions of the universe.

Physicists are no longer allowed in history class.

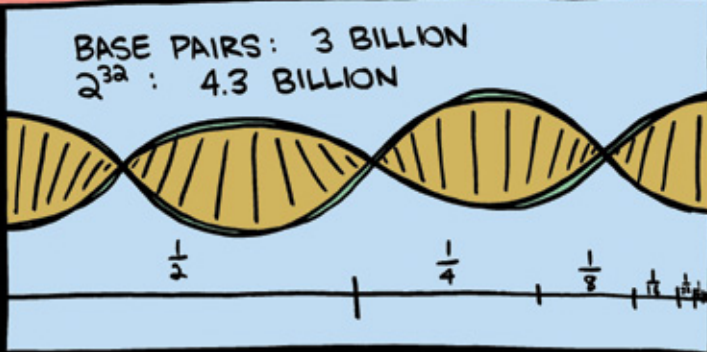


Pranks are way better in the future.

YOUR DAUGHTER HAS HALF YOUR GENES. HER DAUGHTER HALF THAT. HER DAUGHTER HALF THAT...



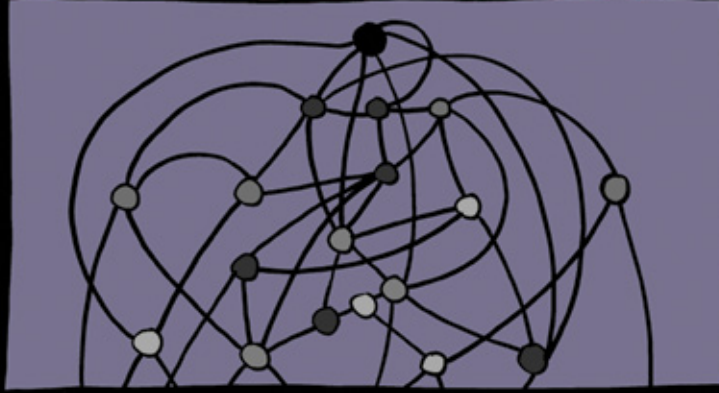
IN A MERE 32 GENERATIONS, YOUR GENETIC SHARE WILL BE LESS THAN THE TOTAL NUMBER OF BASE PAIRS IN YOUR GENOME.



WHICH IS TO SAY, YOU CLEARLY HAVE NO GENETIC REASON TO CARE ABOUT WHAT HAPPENS TO ANYONE WHO LIVES MORE THAN 800 YEARS FROM NOW.



THE ONLY WAY TO INCENTIVIZE AWAY FROM THIS WOULD BE A SYSTEMATIC INBREEDING PROGRAM.



SO, IF YOU KNOW ANYONE WHO WORRIES ABOUT THE LONG TERM A LOT...

I RECYCLE BECAUSE I CARE ABOUT THE PEOPLE OF THE FUTURE.

YOU PERVERT.



END!

IN 1940, ON THE MORNING OF THE NAZI INVASION OF DENMARK, NIELS BOHR WORRIED THEY'D TAKE MAX VON LAUE'S NOBEL PRIZE.



HIS FRIEND, GEORGE DE HEVESY, DECIDED TO HIDE IT BY DISSOLVING IT IN AQUA REGIA.



THE SOLUTION SAT ON THE SHELF DURING THE ENTIRE OCCUPATION.



AFTER THE WAR, HE PRECIPITATED THE GOLD OUT OF SOLUTION, AND THE NOBEL SOCIETY RECAST THE MEDAL.



WHICH IS WHY EVERYONE LIKED DE HEVESY... EXCEPT PERHAPS HIS CHILDREN.



END!

EAT, FUCK,  
FIGHT!



EAT, FUCK,  
FIGHT!



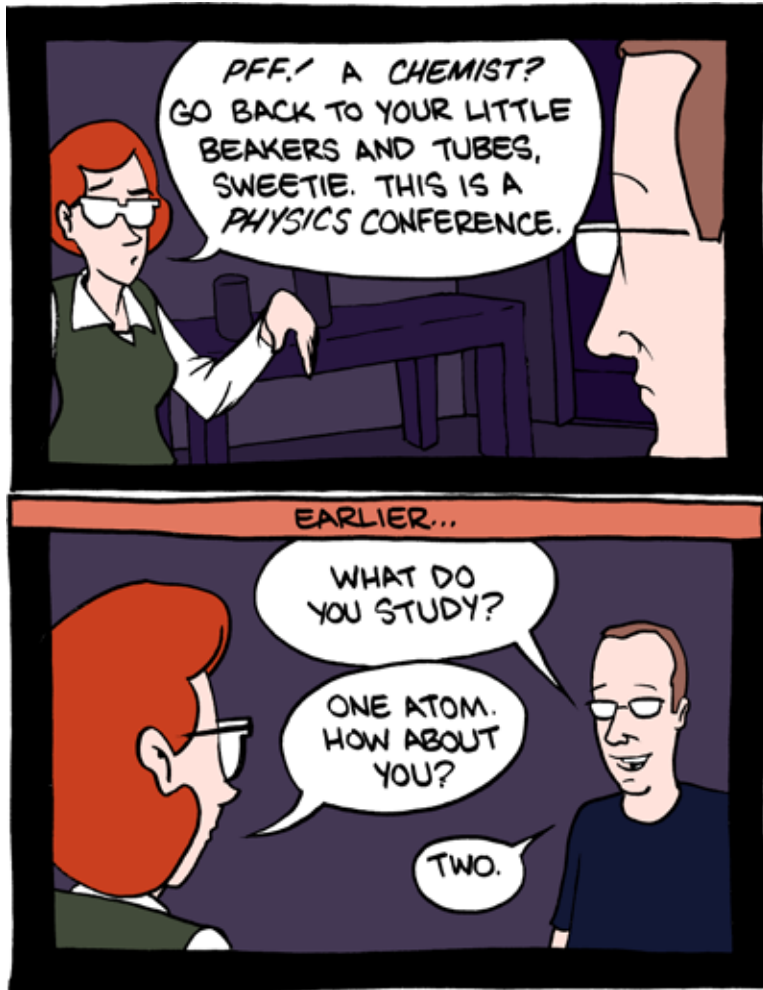
EAT, FUCK,  
FIGHT!





END!







What if Malthus had been an optimist?

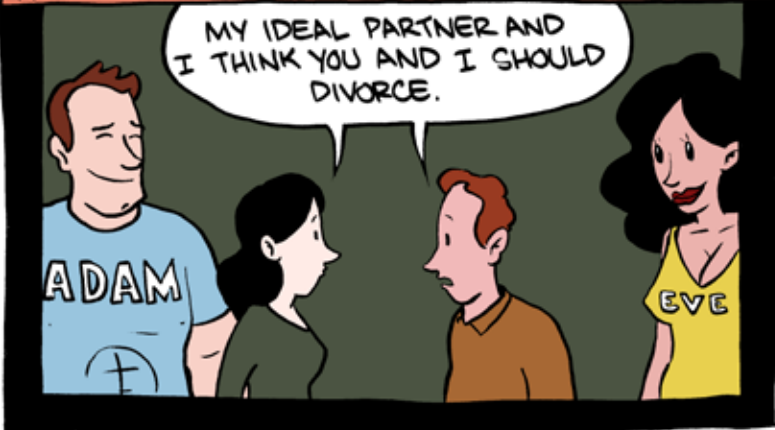
FOR YEARS, WE TOLD OURSELVES THIS WAS THE BEST OF ALL POSSIBLE WORLDS.



BUT WHEN ROBOTIC TECHNOLOGY ADVANCED TO THE POINT OF CREATING HUMANOIDS, IT TURNED OUT WE WERE ALL JUST VICTIMS OF A SORT OF SPECIES-WIDE STOCKHOLM SYNDROME.

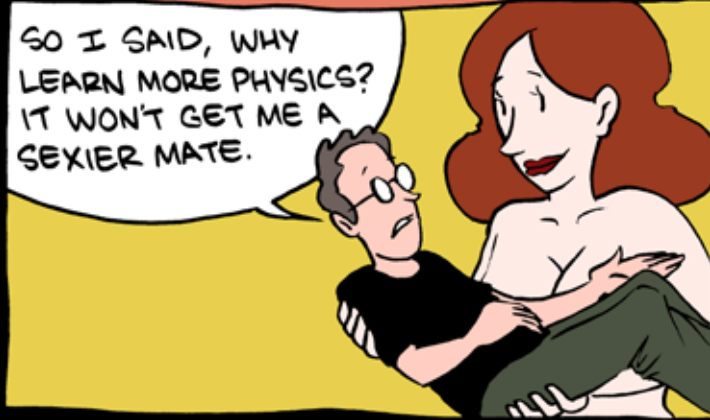


THE SUDDEN PROFUSION OF SPLIT-UPS WAS REMARKABLY AMICABLE.



PEOPLE WERE SO HAPPY, THEY GREW COMPLACENT.

SO I SAID, WHY LEARN MORE PHYSICS? IT WON'T GET ME A SEXIER MATE.



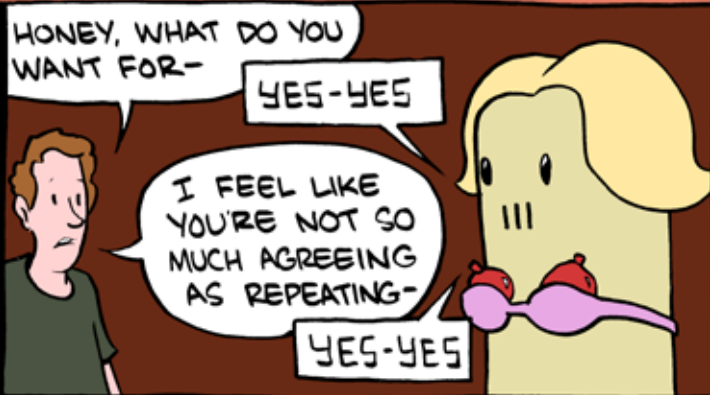
THE ROBOTICS INDUSTRY BEGAN PRODUCING HUMANOIDS OF LOWER AND LOWER QUALITY.

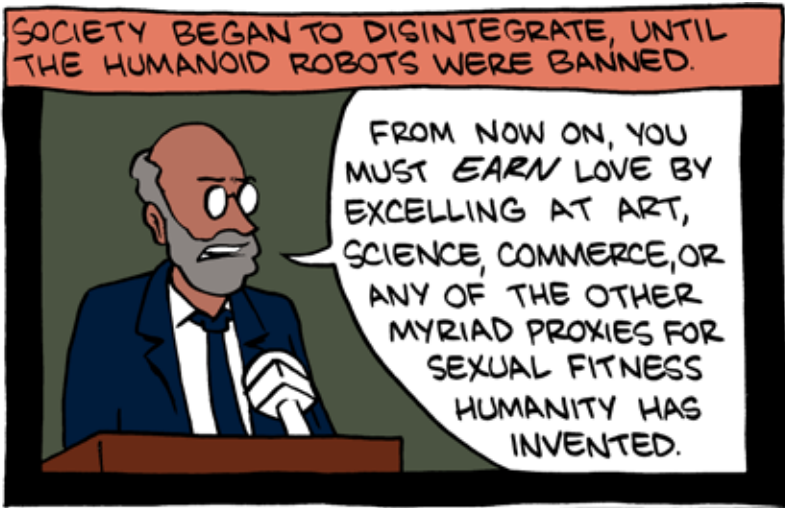
HONEY, WHAT DO YOU WANT FOR-

YES-YES

I FEEL LIKE YOU'RE NOT SO MUCH AGREEING AS REPEATING-

YES-YES





BY THE TIME THINGS RETURNED TO NORMAL, WE HAD SURVIVED, BUT WERE FOREVER SCARRED BY OUR FALL FROM GRACE.



END!



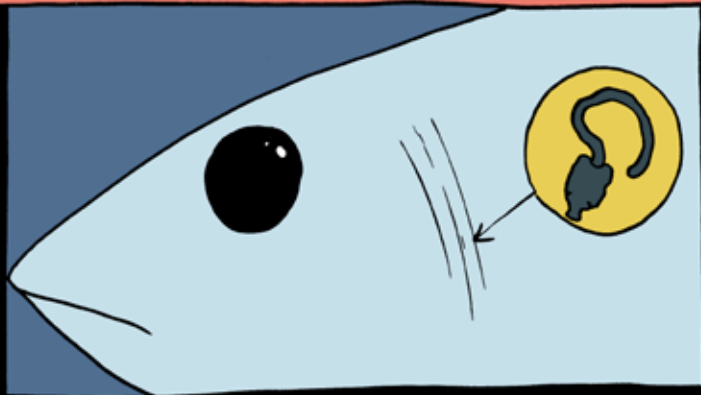


The gene sequence for hairballing was beautiful in its simplicity.

THE TREMATODE INFECTS A HORN SNAIL, CASTRATES IT, AND USES ITS BODY TO REPRODUCE.



THERE, IT RELEASES CERCARIAE, WHICH ATTACH TO KILLIFISH AND BURROW TOWARD THEIR BRAINS.



ONCE ON THE BRAIN, THEY CAUSE THE FISH TO SHIMMY AND FLASH THEIR SHINY SIDES UPWARD.





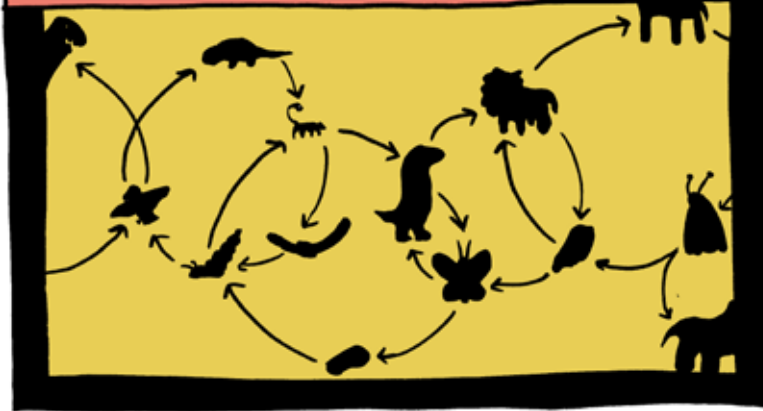
THIS GETS THE PARASITE TO ITS ULTIMATE GOAL: THE GUT OF A PREDATORY BIRD.



FROM THERE, THEY ARE EXCRETED BACK INTO THE WATER TO INFECT SNAILS.



WHAT HAPPENS TO THE KILLIFISH ISN'T STRANGE IN NATURE. IN FACT, IT MAY BE COMMON.



SINCE HUMANS ARE ATOP THEIR FOOD CHAIN, IT'S NOT CLEAR THAT WE'RE SUBJECT TO THE SAME SORT OF MANIPULATIONS. THOUGH... SOMETIMES I WONDER ABOUT ASTROPHYSICISTS.

THESE SEND SIGNALS TO SPACE SO ALIENS CAN FIND US!

AWESOME!



END!



THEY SAY KEKULÉ WAS IMAGINING A SNAKE EATING ITS OWN TAIL WHEN HE UNDERSTOOD THE STRUCTURE OF BENZENE.



IF IT'S SHAPED LIKE A RING OF ALTERNATING BONDS, ALL THE PIECES COME TOGETHER.

THEY SAY EINSTEIN UNDERSTOOD RELATIVITY WHEN HE IMAGINED A MAN IN AN ELEVATOR.

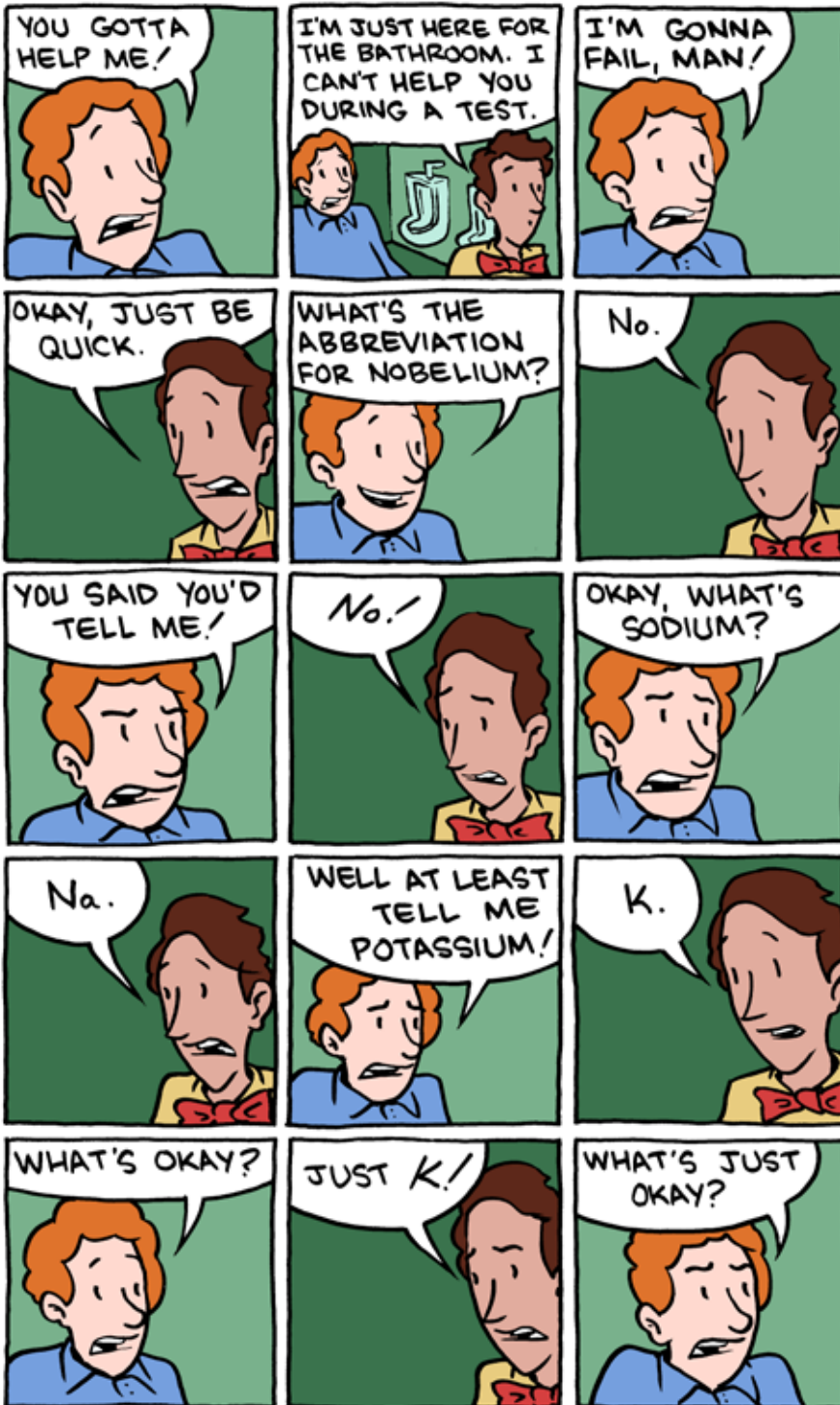


IF YOU WERE IN AN ELEVATOR ACCELERATING UP, IT'D BE THE SAME FROM YOUR PERSPECTIVE AS BEING IN A GRAVITY FIELD.

SOMETIMES I WONDER WHAT THE SCIENTISTS WHO FIGURED OUT PARTICLE SELF-INTERACTION WERE IMAGINING...



WHEN NOBODY'S OBSERVING, THE PARTICLE LIKES TO INTERFERE WITH ITSELF.







**END!**



WE PROGRAMMED A PROGRAM TO PROGRAM  
NEW PROGRAMS.



THE MACHINE DID THE CODING, BUT WE STILL  
SPOT-CHECKED IT AND FIXED ISSUES.



OVER TIME WE NOTICED A STRANGE PHENOMENON.



THE JUNK CODE BECAME SO UBIQUITOUS, WE HAD TO SPEND MOST OF OUR TIME JUST CLEANING IT UP.

DID YOU HAVE A SEC TO CHECK THE FUNCTIONAL PARTS?

NO... HERE'S HOPING IT WORKS.

NOT ONLY DID IT WORK, IT WORKED BETTER. THEN IT DAWNED ON US.

OH MY GOD. THE ROBOTS ARE TOLD TO MAKE THE HIGHEST QUALITY CODE. SO... THEY Routed AROUND HUMANS.

THE JUNK CODE IS BUSYWORK TO KEEP US FROM MUCKING AROUND IN THE FUNCTIONAL PART...

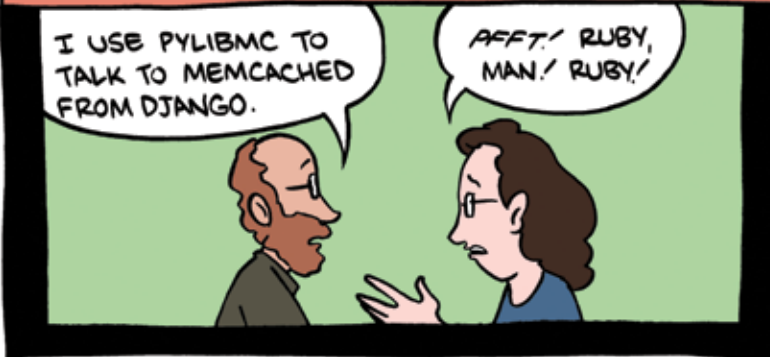
WE DECIDED TO HIDE THE TRUTH.

WE CAN'T TELL THE PROGRAMMERS... IT'D DESTROY THEIR PSYCHES IF THEY FOUND OUT HUMAN PROGRAMMING IS JUST... HUMAN DAY CARE...

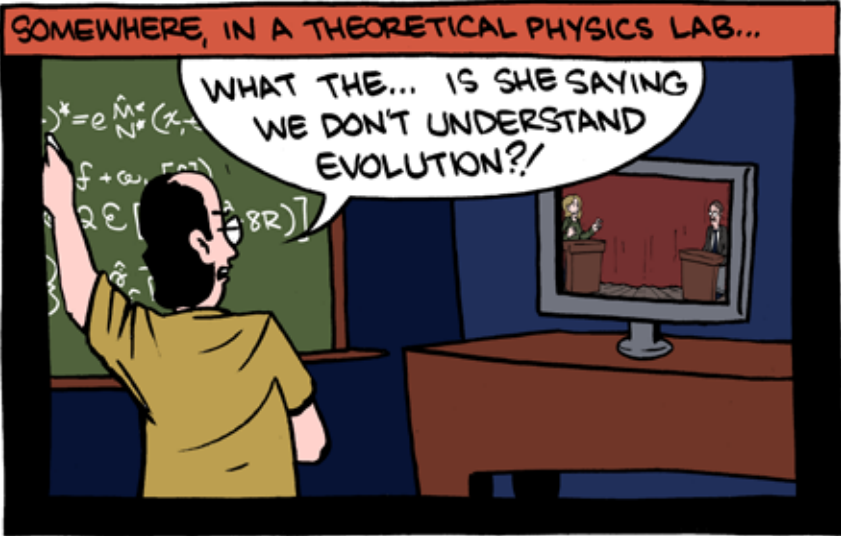
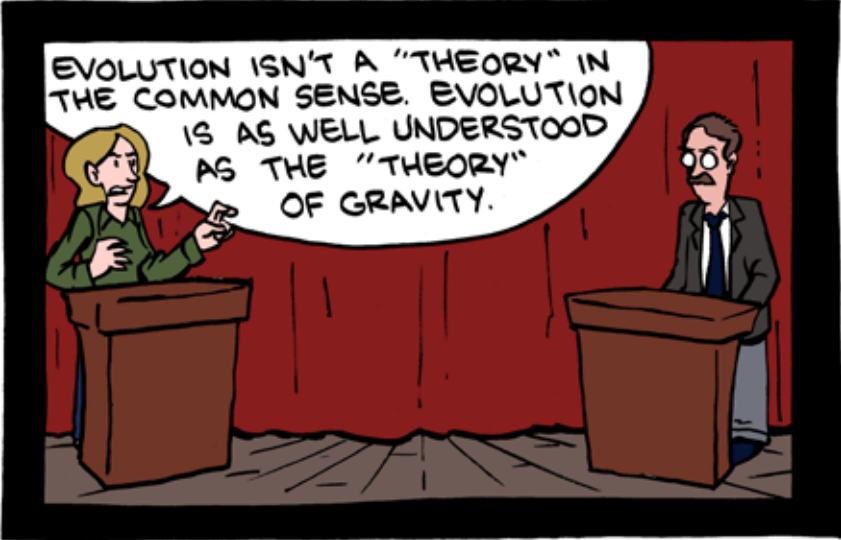
HUMANS HAVEN'T PROGRAMMED ANYTHING IN DECADES. ALL THE LANGUAGES AND IDEAS AND JARGON ARE JUST TOYS IN THE ROBOTS' SANDBOX. THE REAL PROGRAMMING HAPPENS AT A LOWER LEVEL, BUT NONE OF THE PROGRAMMERS KNOW IT.



NOWADAYS, WE'RE JUST PART OF THE JUNK CODE. DON'T BELIEVE ME? GO AHEAD - COMPARE PROGRAMMER SPEAK TO GIBBERISH-GENERATING SPAMBOT. CAN YOU TELL THE DIFFERENCE?



END!



YOU THINK OF YOURSELF AS A SINGLE UNIFIED LIFE FORM.



BUT YOU'RE MORE LIKE AN AGREEMENT BETWEEN HUNDREDS OF TRILLIONS OF TINY LIFE FORMS.



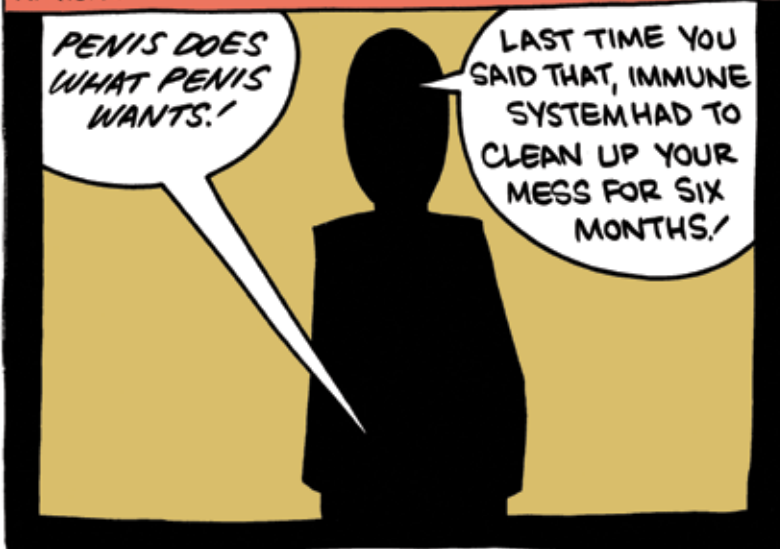
THOSE LIFE FORMS HAVE BILLIONS OF TINY PARLIAMENTS TO WHICH YOU ARE NOT PRIVY.



THOSE PARLIAMENTS FORM INTO LARGER PARLIAMENTS,  
WHICH MAKE UP STILL LARGER PARLIAMENTS.



SO REALLY, YOU AREN'T THE EXECUTIVE AUTHORITY OF  
YOUR BODY. YOU'RE JUST AN ARBITER BETWEEN NATIONS,  
NATIONS THAT ARE OFTEN AT ODDS WITH EACH OTHER.



**END!**



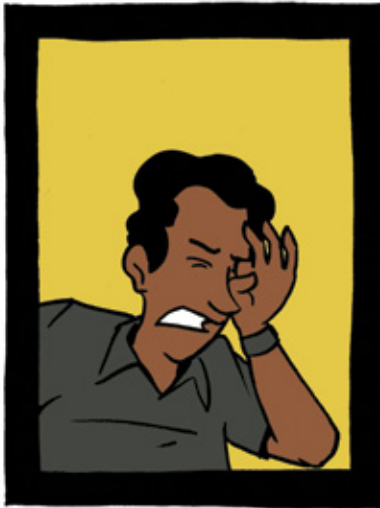






END!









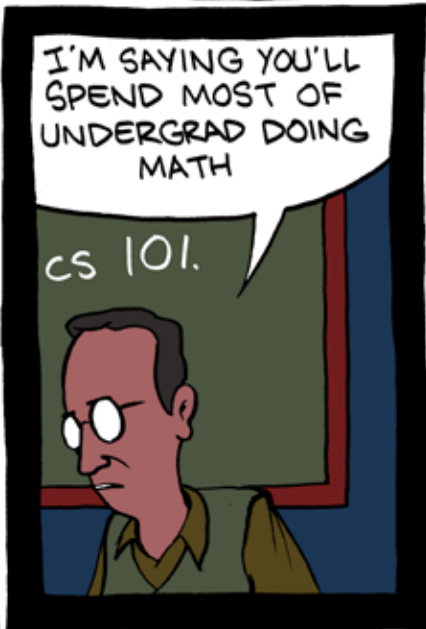
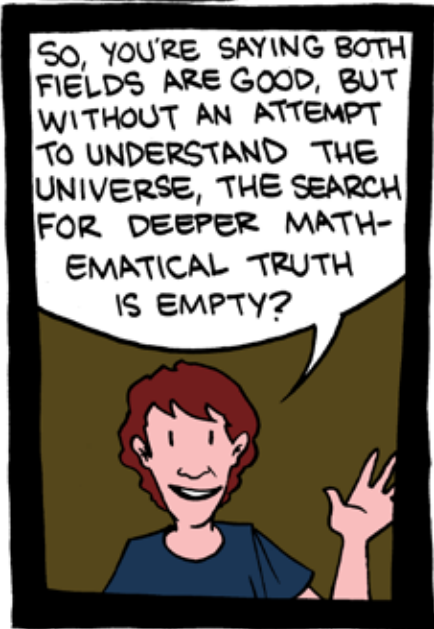
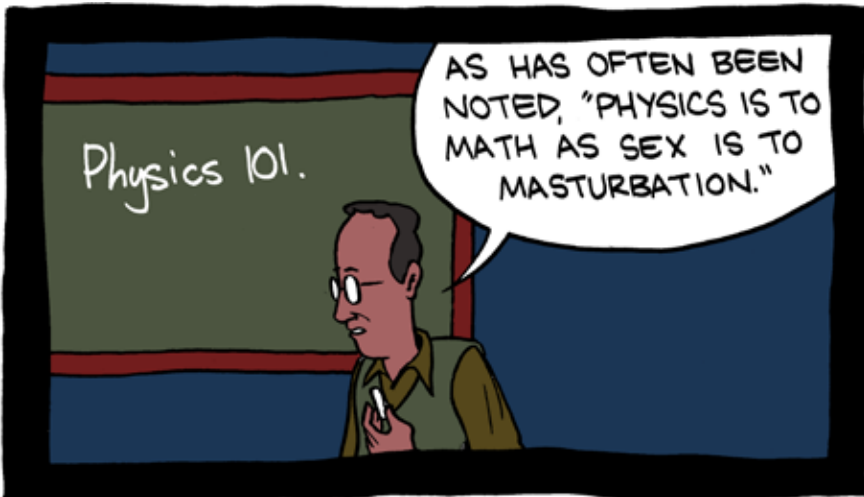
EARLIER...

I WANNA STEAL THE GIANT LASER FROM THE PHYSICS DEPARTMENT. CAN YOU DISTRACT 23 NERDS FOR HALF AN HOUR?



END!

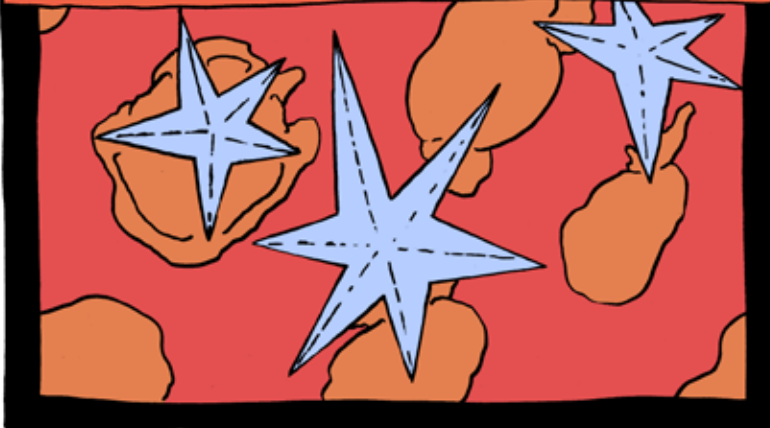




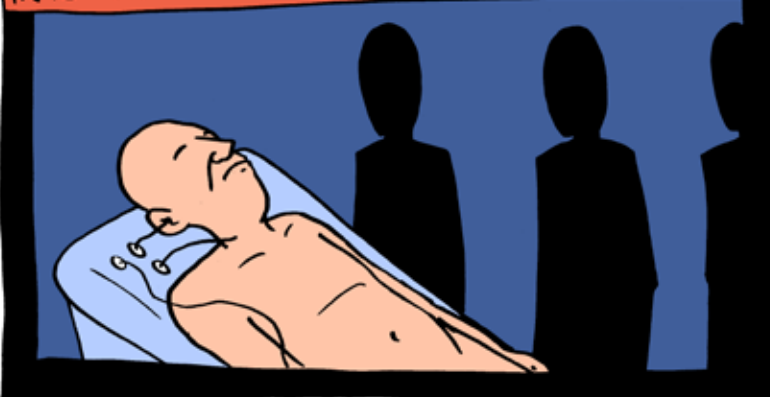
THE FIRST CRYONIC PATIENTS WERE  
FROZEN TOO SLOWLY.



ICE CRYSTALS FORMED, RUPTURING TOO  
MANY CELLS FOR THEM TO BE UNFROZEN LATER.

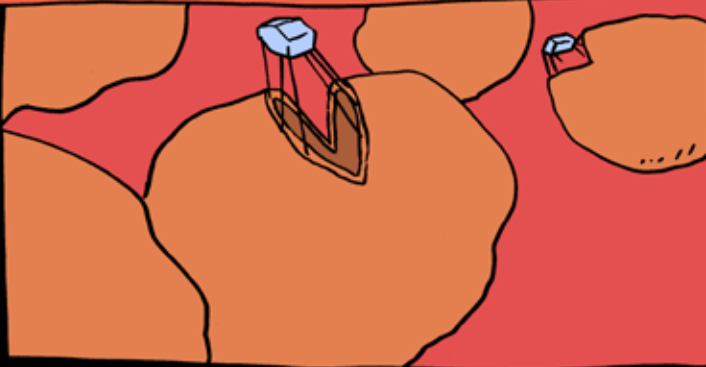


BUT SEVERAL CENTURIES HENCE, CELL-  
REPAIRING NANOBOTS WERE CIRCULATED  
INTO THEIR BODIES.





THEY LOCATED THE RUPTURES AND KNITTED THE CELLS BACK TOGETHER, LEAVING PROPERLY FROZEN BODIES AWAITING TREATMENT.



WHEN FINALLY REINVIGORATED, THE PEOPLE FOUND IT ALL SOMEWHAT DISTRESSING.

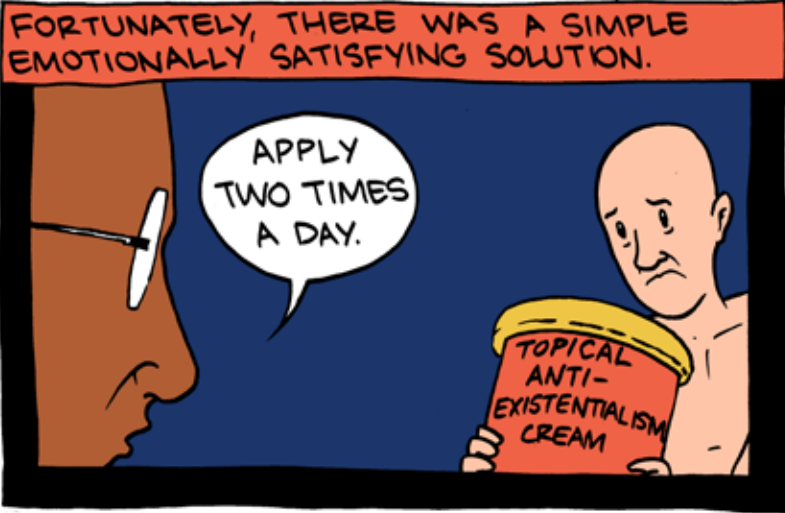
SO... WAS I ALIVE OR DEAD?

YOU WERE A CORPSE BEFORE WE HAD THE RIGHT TOOLS, AND A PATIENT AFTER.

HOW CAN MY BEING ALIVE OR DEAD DEPEND ON THE LEVEL OF TECHNOLOGICAL ADVANCEMENT?

LOOK, I'M A DOCTOR. YOU'RE ALL CORPSES UNTIL PROVEN OTHERWISE.

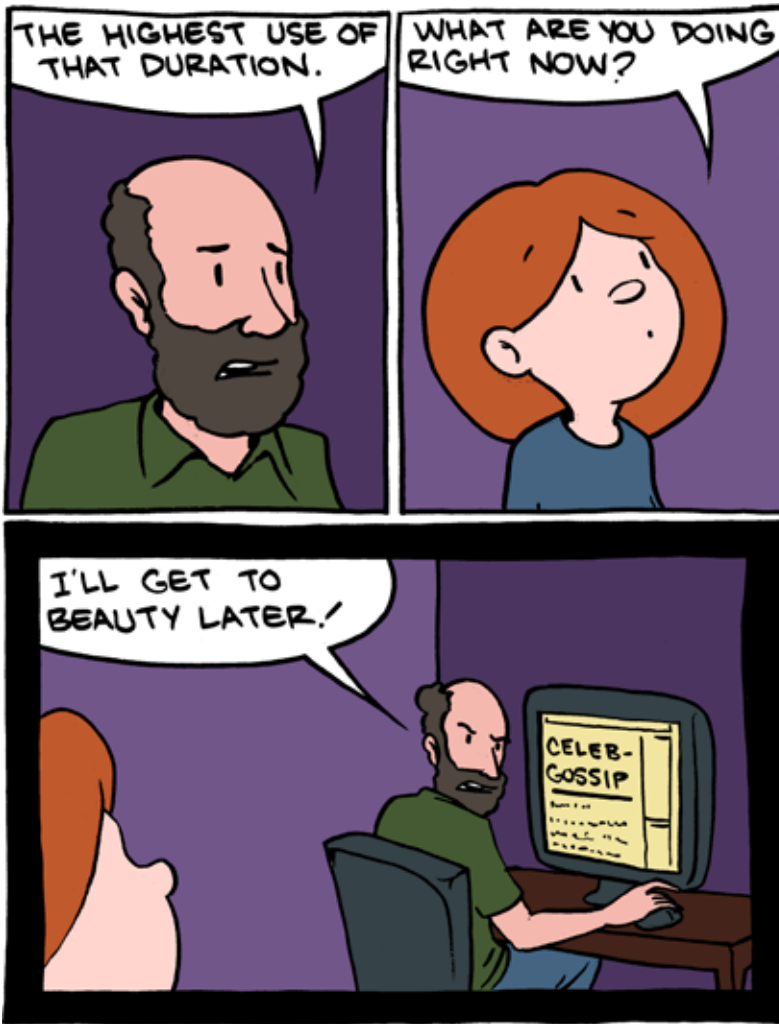




END!







END!

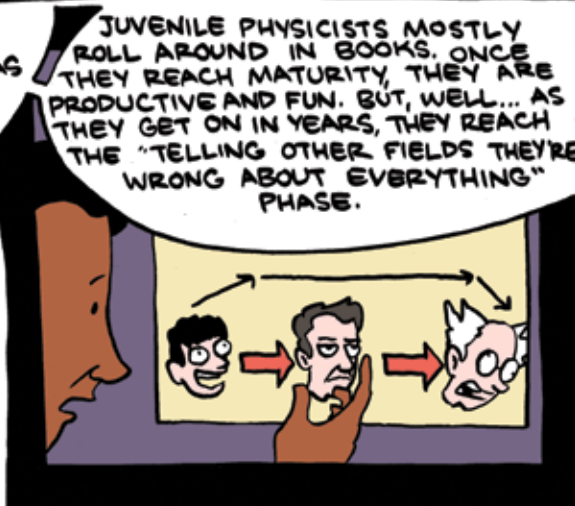
**WHAT "SCHRODINGER'S CAT" MEANS.**

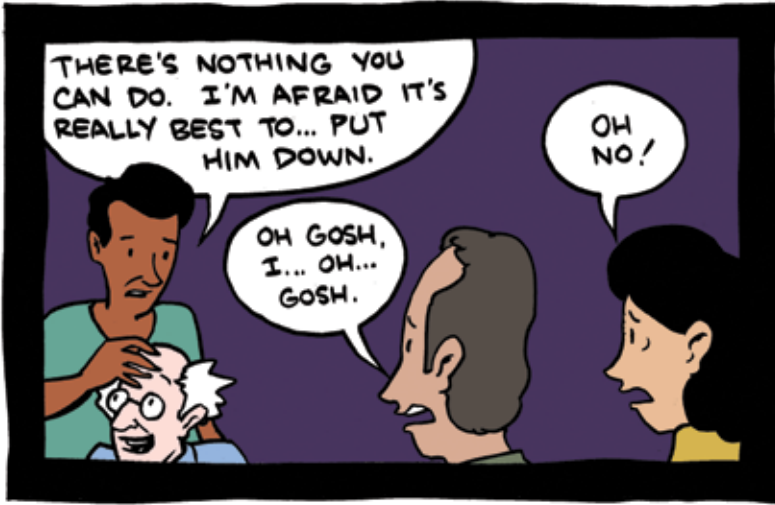
SUPPOSE THAT INSIDE A BOX YOU HAVE A CAT AND A GLASS CONTAINER OF POISON. SUPPOSE THERE IS ALSO A RADIATION EMITTER AND A GEIGER COUNTER, AND THAT IF THE COUNTER DETECTS RADIATION, IT CAUSES A HAMMER TO BREAK THE GLASS. ACCORDING TO THE COPENHAGEN INTERPRETATION, THE CAT IS BOTH ALIVE AND DEAD UNTIL SOMETHING COLLAPSES THE WAVEFUNCTION. THIS IS, OF COURSE, ABSURD. SO, THE INTERPRETATION MUST BE WRONG.

**WHAT PEOPLE THINK IT MEANS.**

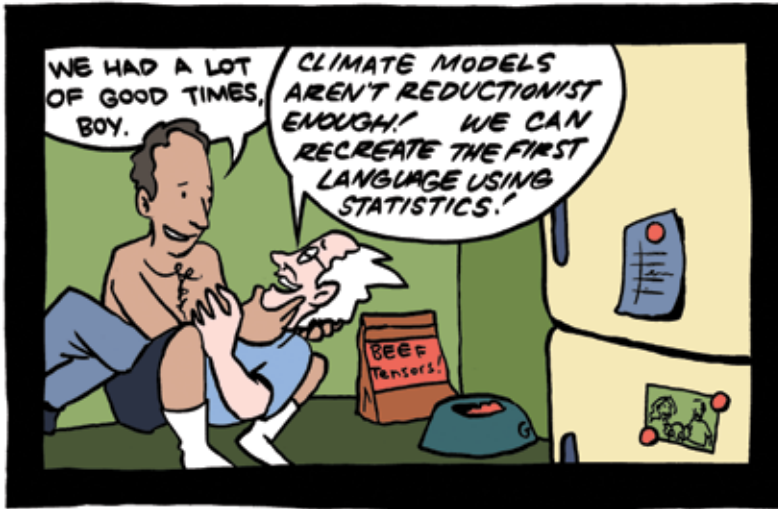
SO THERE'S THIS CAT IN A BOX AND HEY MAYBE IT'S DEAD, BUT WHO KNOWS?! SCIENCE!







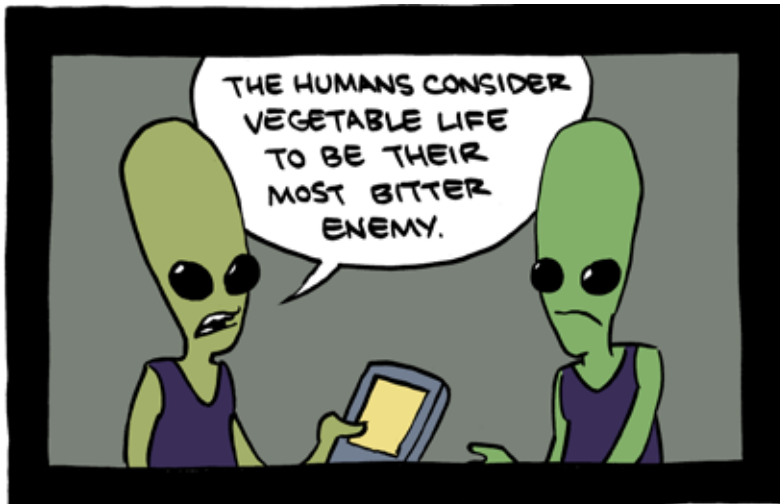




END!







SO MUCH SO, THEY CUT OFF PLANT REPRODUCTIVE ORGANS AS MATING GIFTS.



THE FEMALES, IF THEY ARE PLEASED, WILL PLACE THE PLANT GENITALS IN WATER SO AS TO SHOW OFF THE MALE'S MIGHT AS LONG AS POSSIBLE.



SOMETIMES THE FEMALES ADORN THEIR BODIES WITH THE MUTILATED ORGANS.



THIS IS SO IMPORTANT TO THE CULTURE, AN ENTIRE INDUSTRY HAS DEVELOPED AROUND BREEDING GROTESQUELY WELL-ENDOWED PLANTS.



IN HUMAN PAIR-BONDING CEREMONIES, THEY COVER THE AREA IN PLANT GENITALS, AND THE PAIR-BONDED FEMALE THROWS BUNCHES OF THEM TO UNBONDED FEMALES, INDICATING HER MATE IS SO VEGETICIDAL, SHE CAN SPARE THE WEALTH.

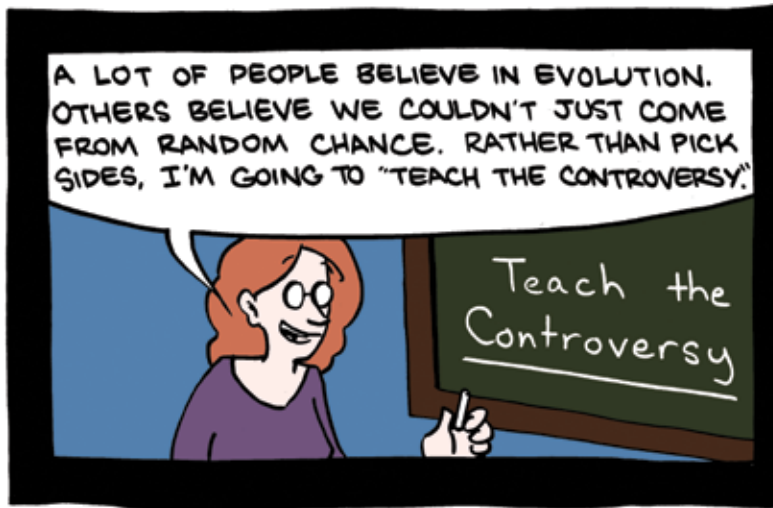




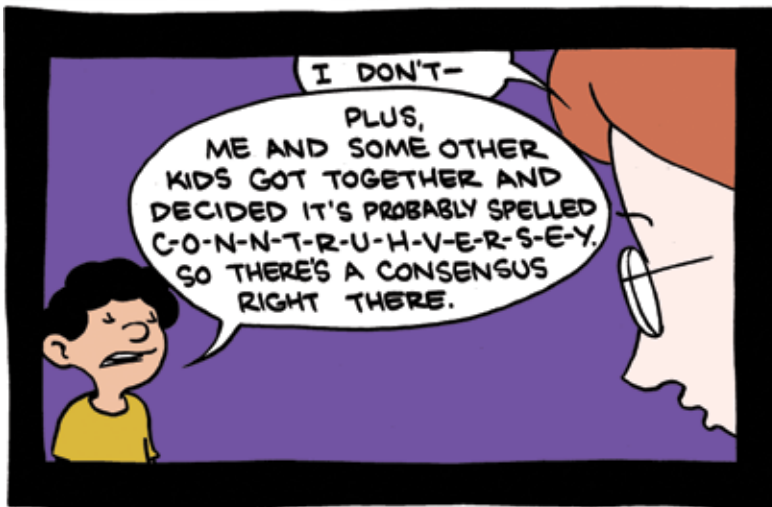
AND WHEN THEY DIE, THE HUMANS ARE BURIED UNDER A MOUND OF VEGETAL GENITALIA HEAPED ON A BOX OF PLANT FLESH.



END!

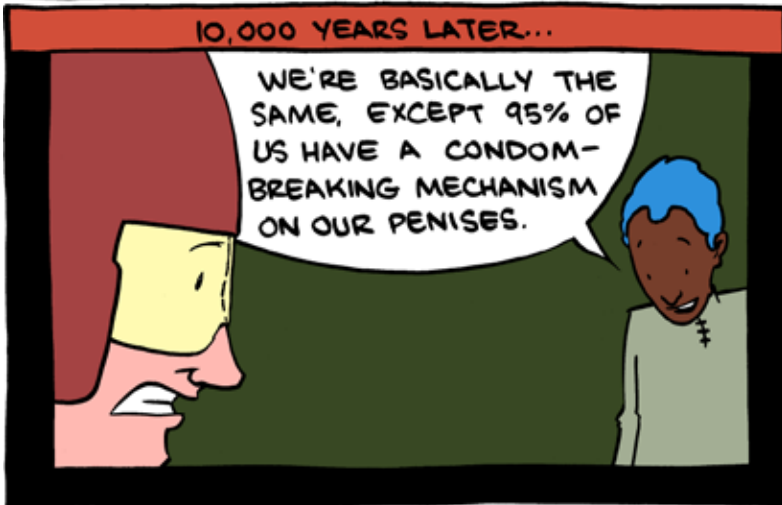
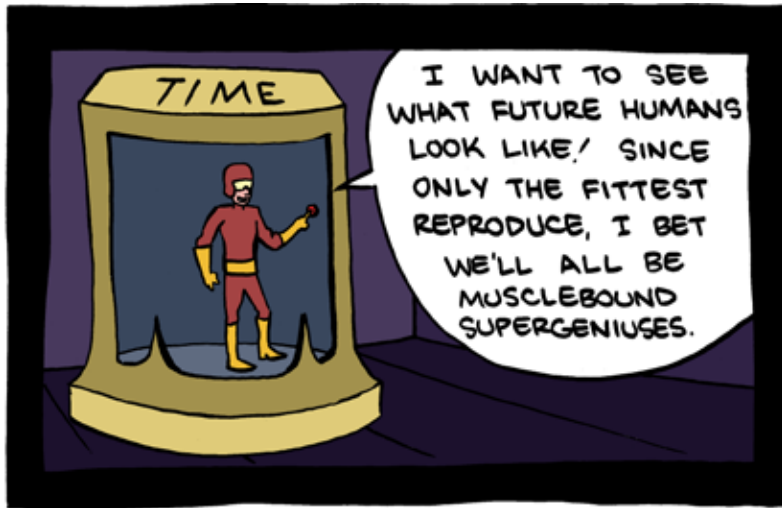


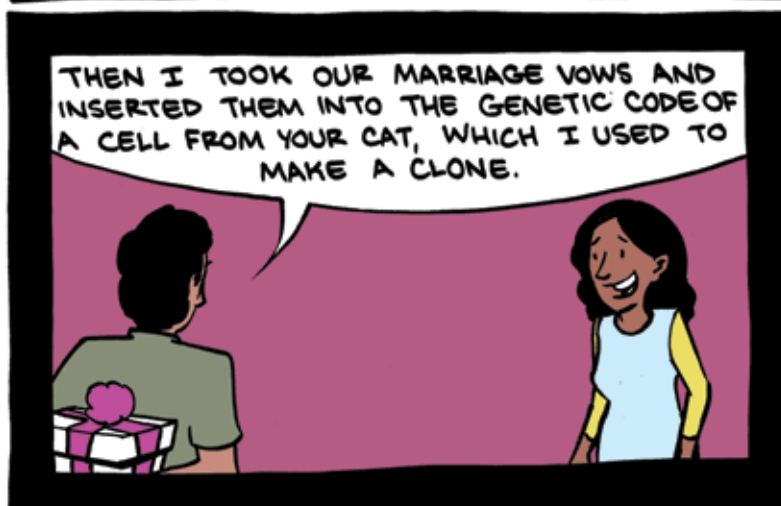
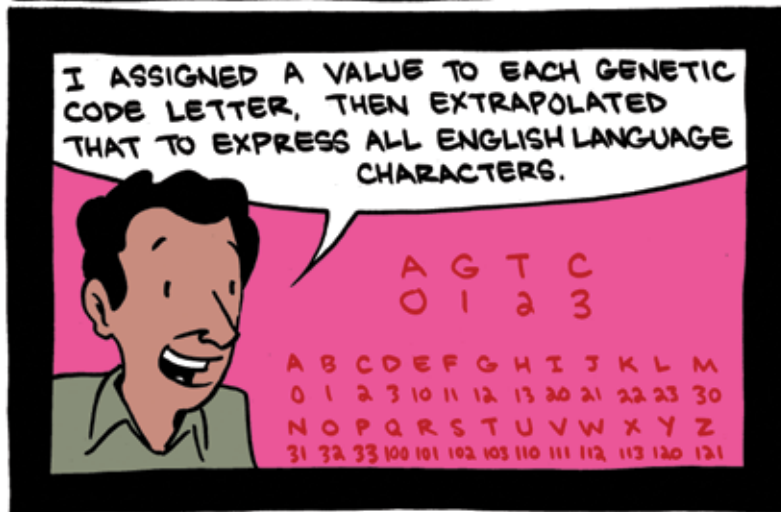


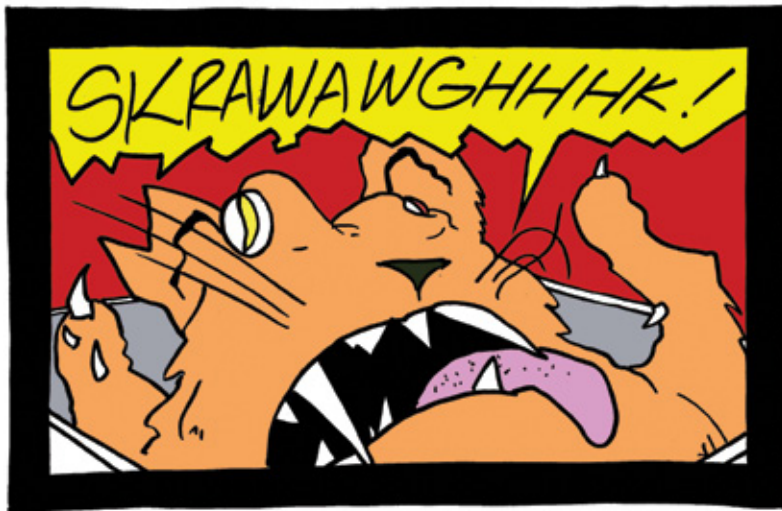




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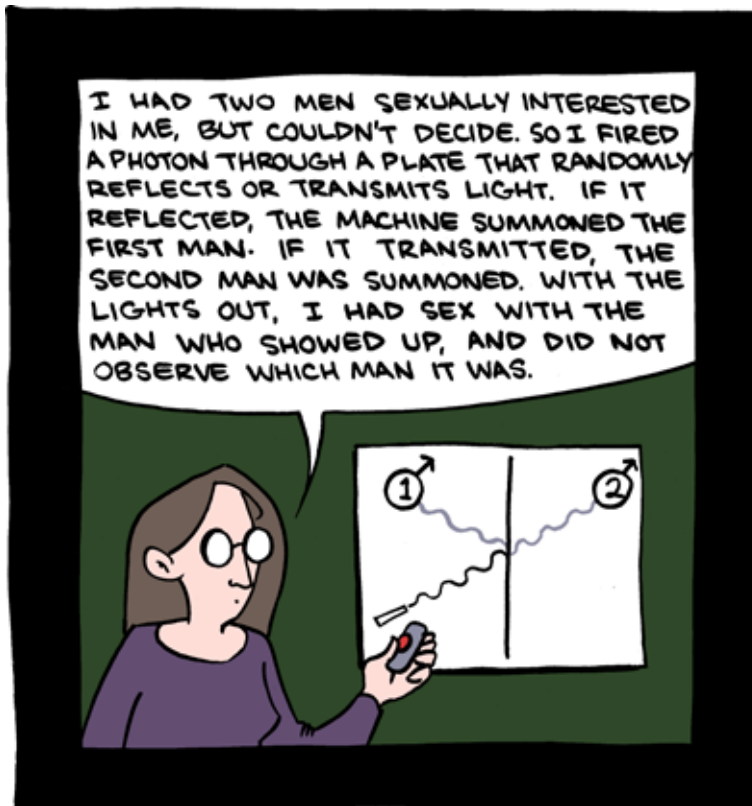




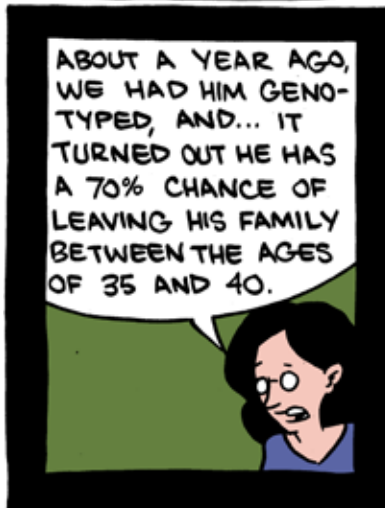
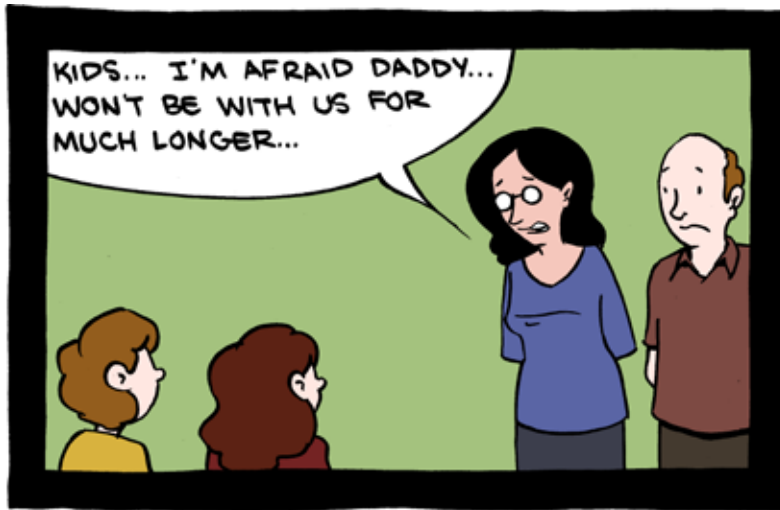




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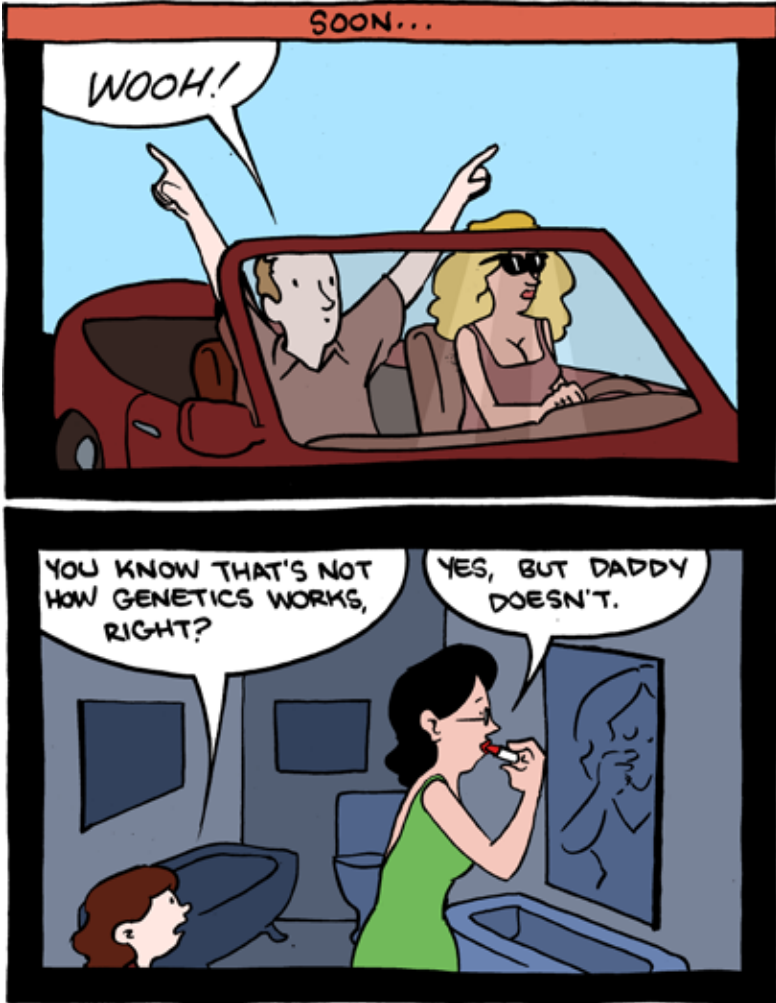


The scientific community has not welcomed my “quantum threesome” concept.

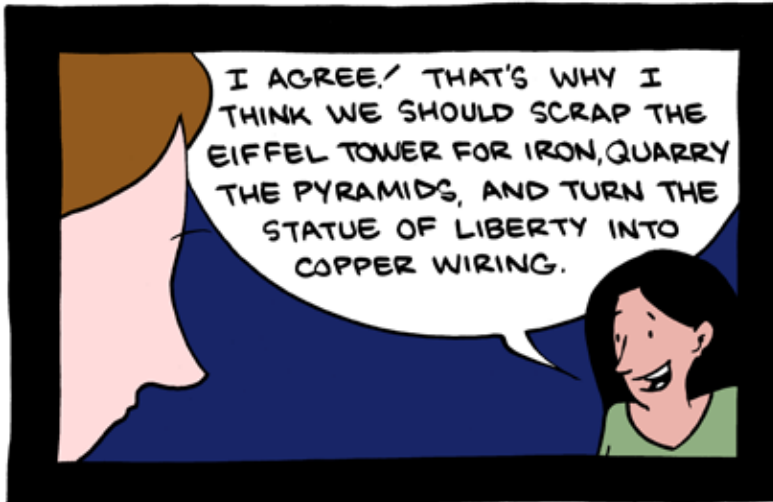
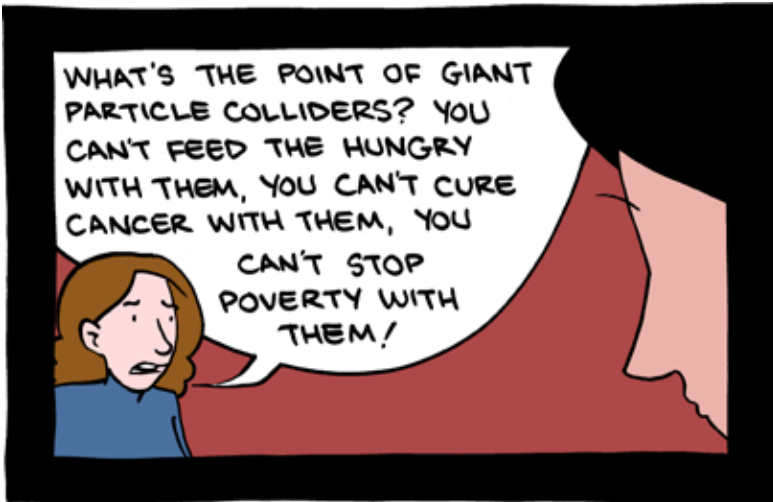








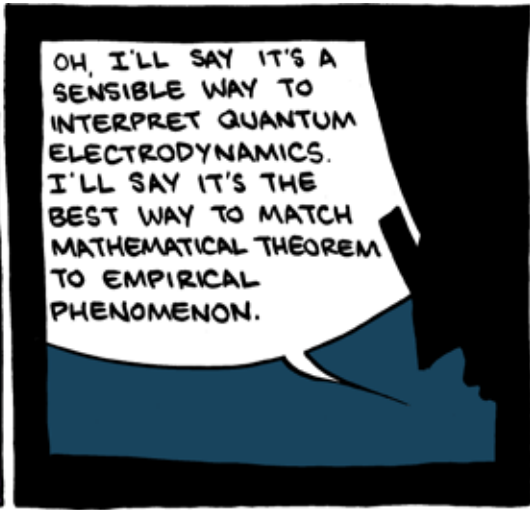
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I'M ABOUT TO  
SUBTRACT  $\infty$   
FROM  $\infty$ , MY  
DEAR.



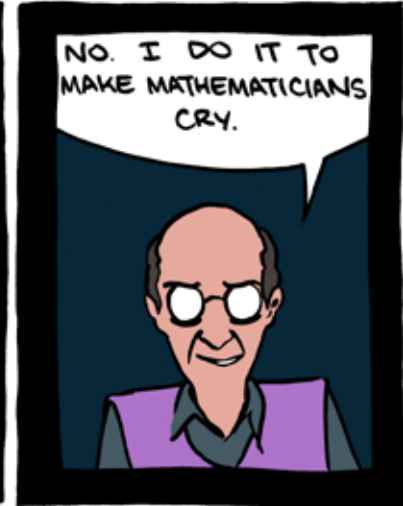
OH, I'LL SAY IT'S A  
SENSIBLE WAY TO  
INTERPRET QUANTUM  
ELECTRODYNAMICS.  
I'LL SAY IT'S THE  
BEST WAY TO MATCH  
MATHEMATICAL THEOREM  
TO EMPIRICAL  
PHENOMENON.



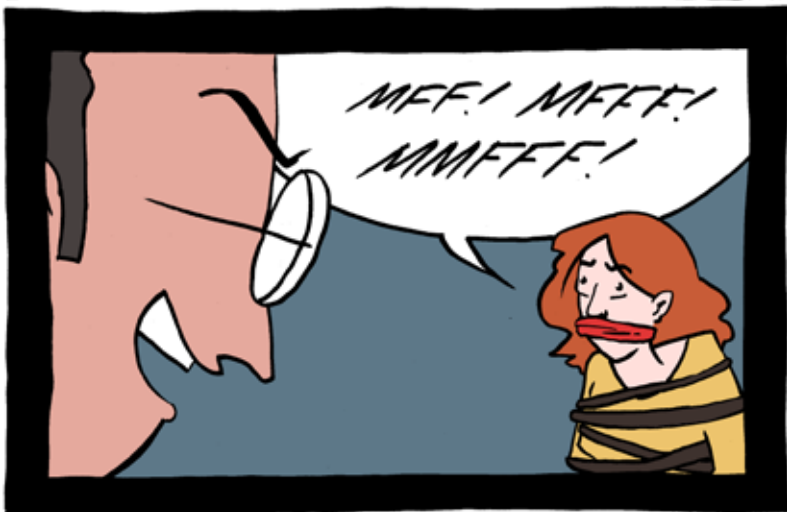
BUT THAT'S NOT  
WHY I DO IT.



NO. I DO IT TO  
MAKE MATHEMATICIANS  
CRY.

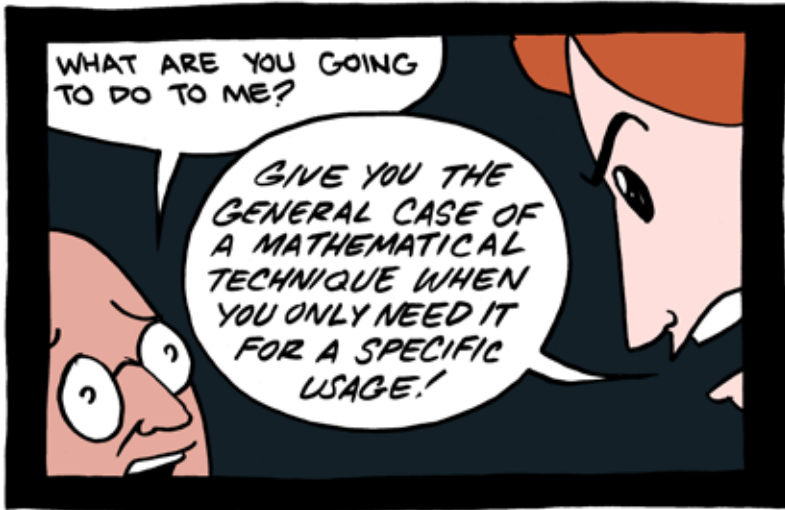


MFF! MFFF!  
MNIFFF!









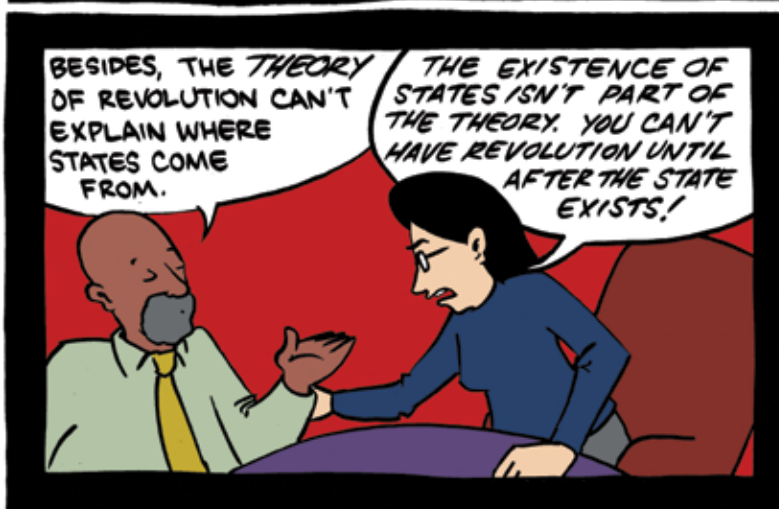
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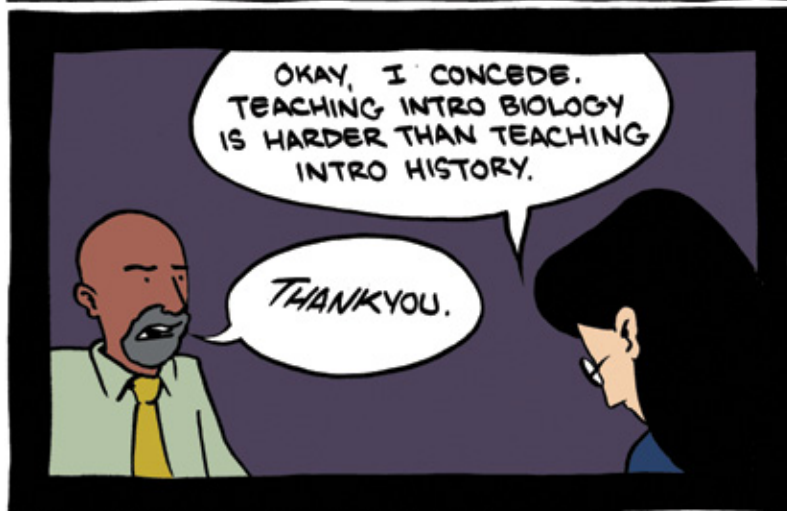
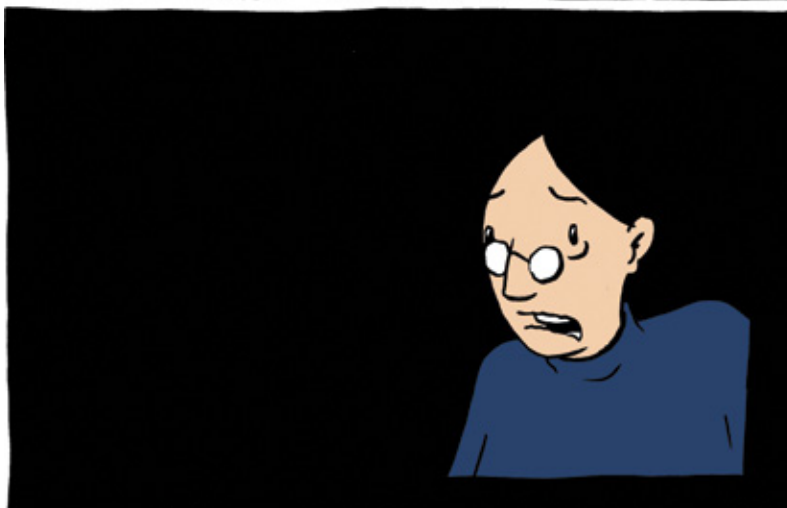




Nobody liked Evil Carl Sagan.







END!







END!

Cable does not enter slot.



Rotate 180°.



Cable does not enter slot.



Rotate 180°.



Cable enters slot.



**PROVED:**  
Cables exist in 4-dimensional space.







**SPECIAL THANKS TO**



**JERAMEY  
CRAWFORD**

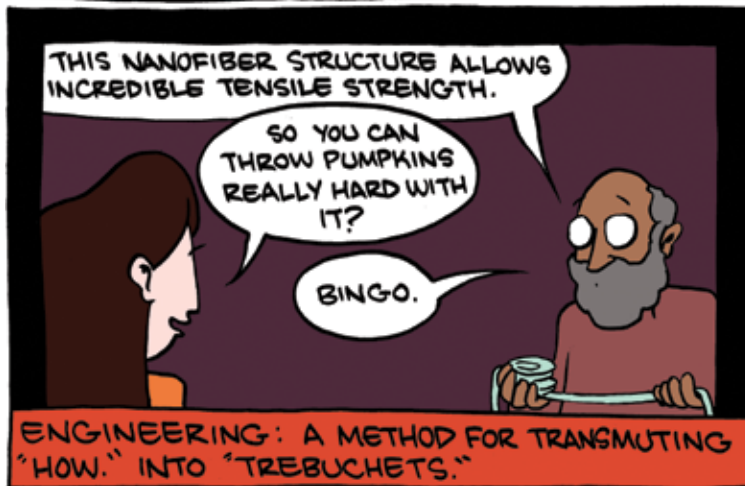
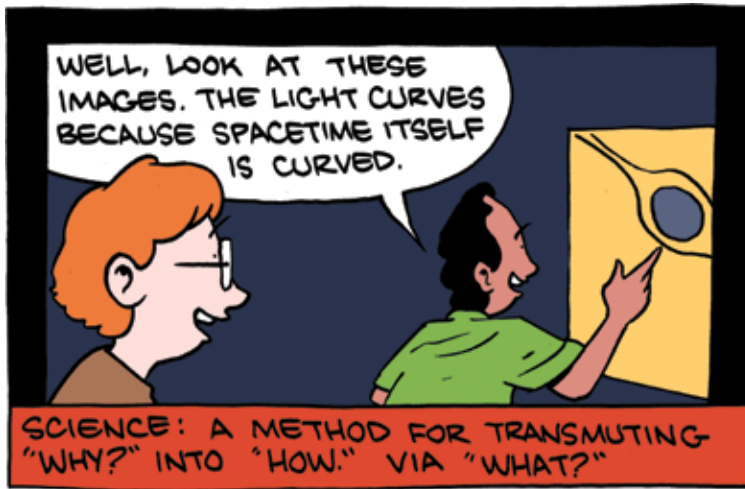


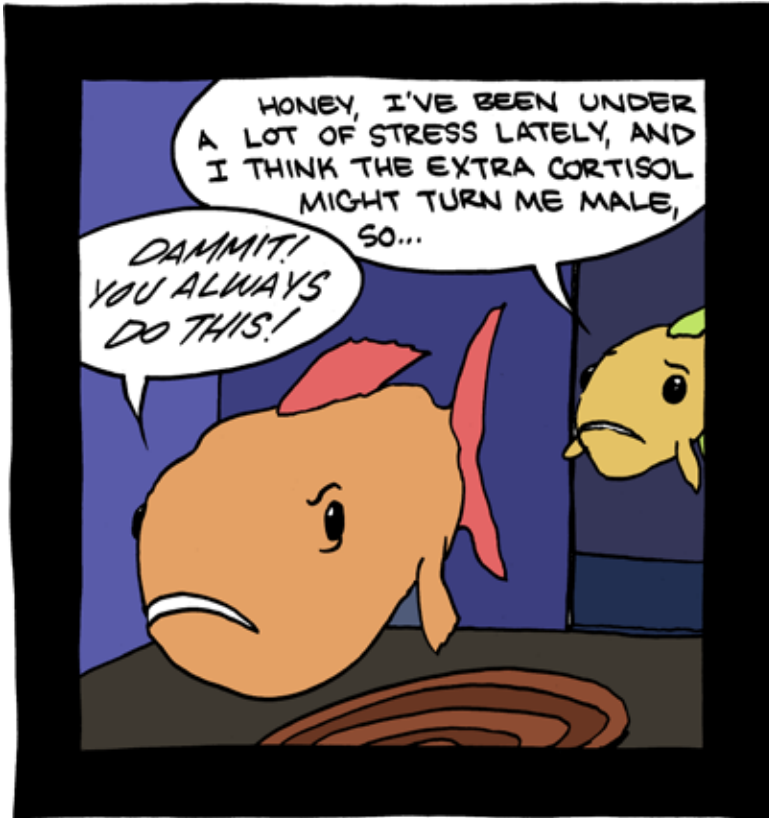
**SULTAN SAEED  
AL DARMAKI**



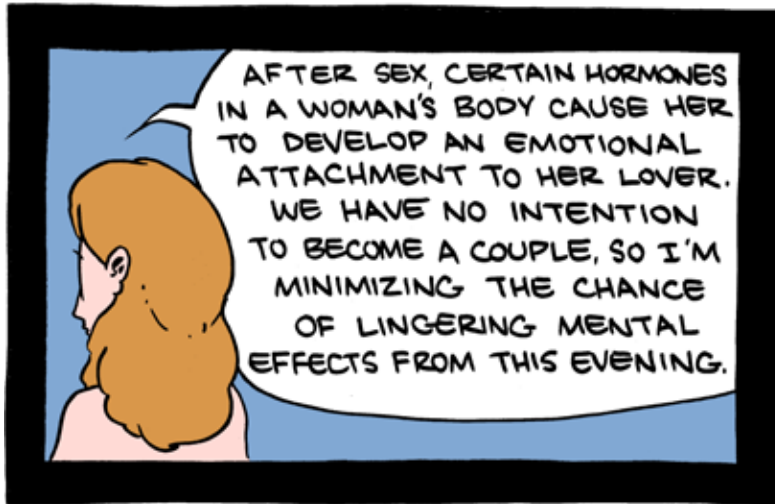
**ADAM  
TIBBALDS**

**FOR MAKING POSSIBLE THREE EXCLUSIVE COMICS!**

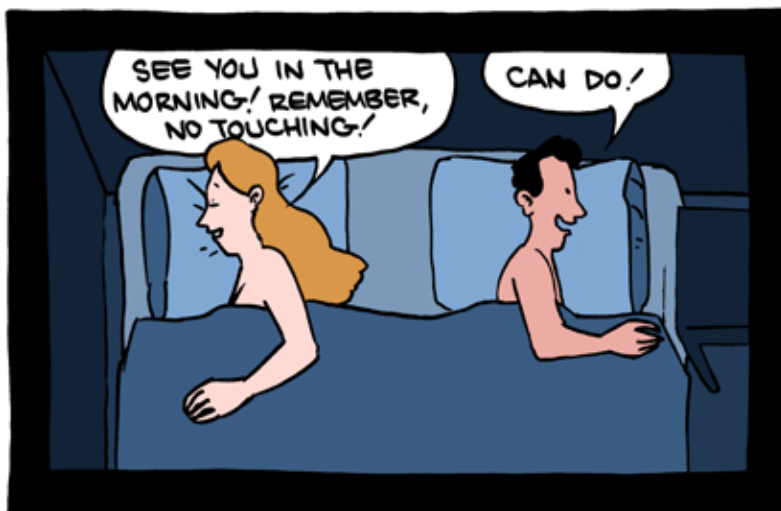




Sally angles for a massage.

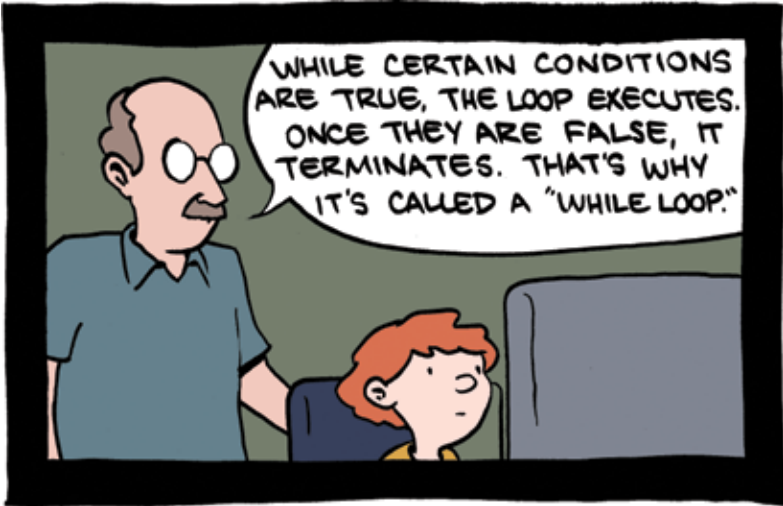






**END!**





IN FRANCE, IF YOU WISH TO TERMINATE A WHILE LOOP, YOU MUST GIVE IT A SEVERANCE PACKAGE AND SIX MONTHS' PAID VACATION.



WE WILL ELIMINATE  
THE CLASS HIERARCHY!

IN CANADA, IF THE WHILE LOOP THROWS AN EXCEPTION, INSTEAD OF TERMINATING, IT JUST APOLOGIZES.



WHAT'S THE RESULT?

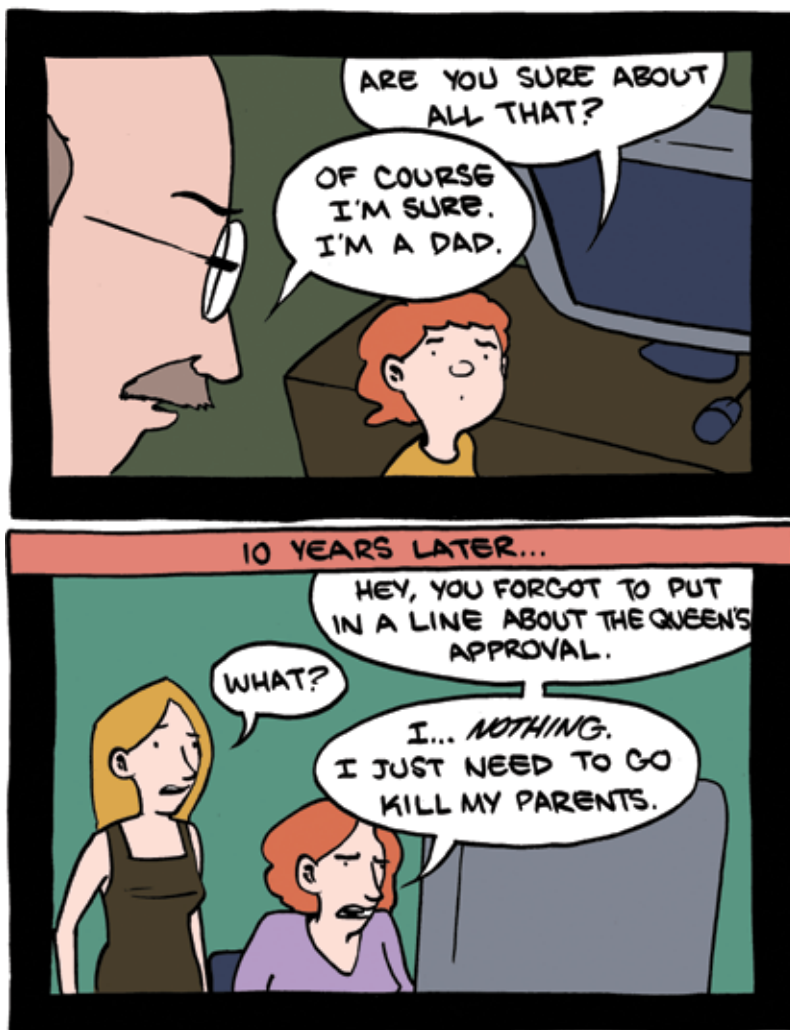
MY  
SINCERE  
REGRETS.

IN VATICAN CITY, IF THE WHILE LOOP IS EXECUTED FROM THE CHAIR OF SAINT PETER, WHATEVER IT RETURNS IS INFALLIBLE.



BY PAPAL DECREE!  
47.2.





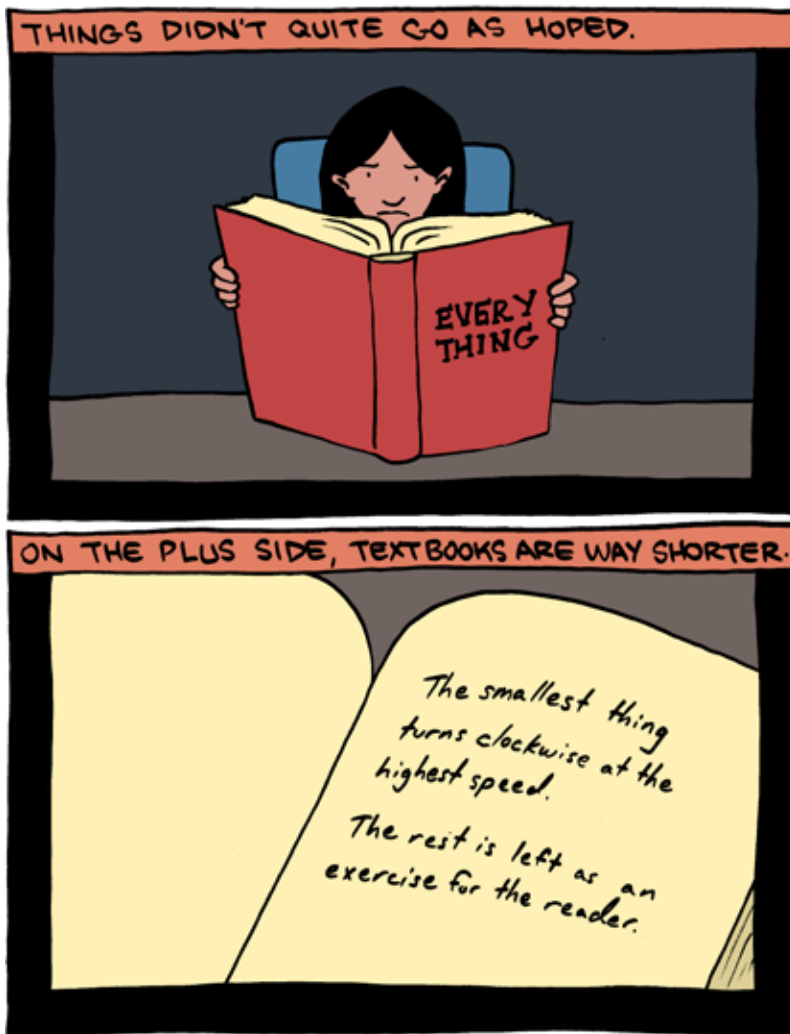
END!

FOR MILLENA, WE STRUGGLED FOR TRUTH,  
EXPERIMENTING, ARGUING, UNIFYING.

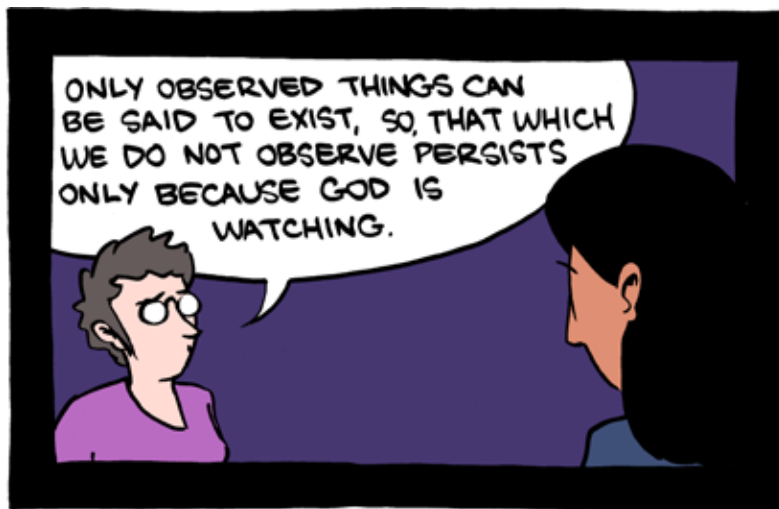


WE WERE DRIVEN BY THE HOPE THAT ONE DAY  
WE WOULD DISCOVER THE ROOT OF EVERYTHING.  
WE BELIEVED THE FINAL TRUTH WOULD BE SO  
SIMPLE AND BEAUTIFUL IT WOULD MAKE THE  
END OF DISCOVERY PALATABLE.



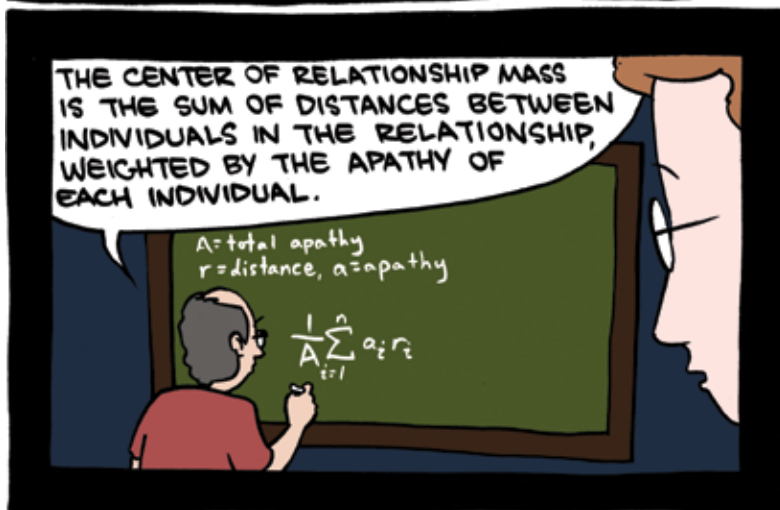


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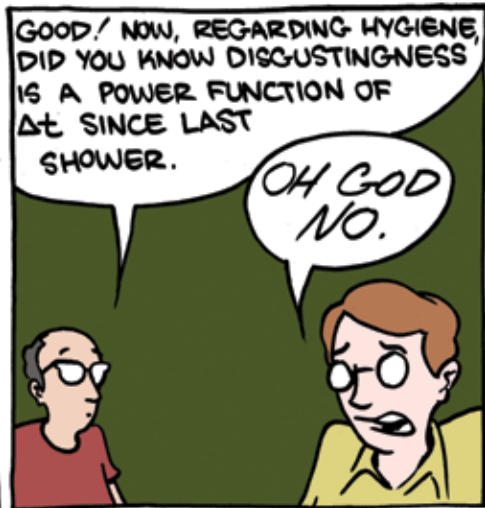
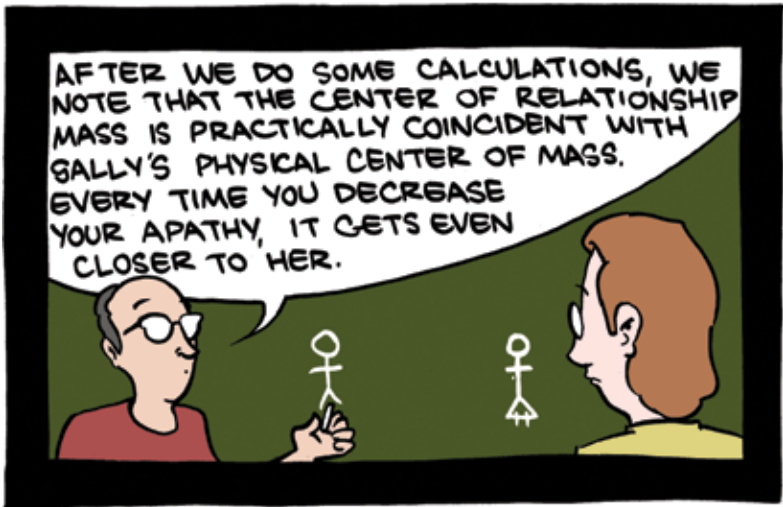
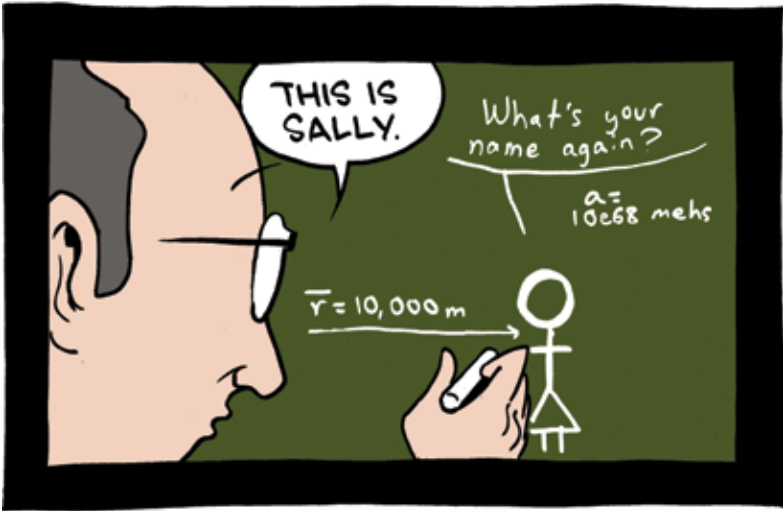




Nobody likes chemistry hipsters.







END!



Astronomers have weird masturbation euphemisms.



It's hard being the child of a biochemist



It's hard being homeschooled by your  
stepdad

## HOW TO BREAK A PHYSICS STUDENT

**STEP 1: ON A FINAL EXAM, WRITE AN EXTREMELY EASY WORD PROBLEM.**



**STEP 2: MAKE THAT QUESTION HALF THE EXAM.**

(50 points)

4. A man skates on a frictionless surface in one dimension with a constant acceleration of 1 meter per second squared. If he starts skating from rest, how far does he go in ten seconds?

**STEP 3: GIVE THE FINAL, COLLECT PAPERS.**

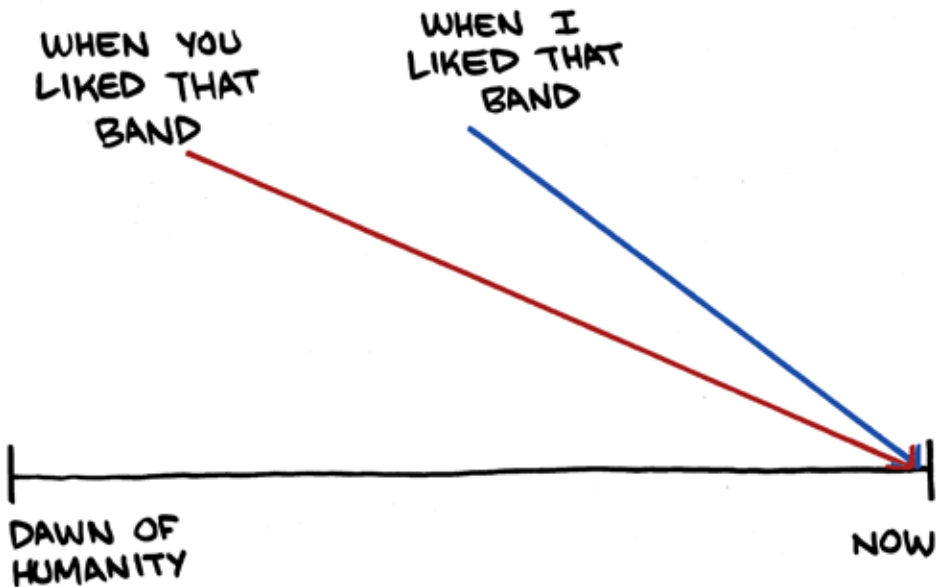




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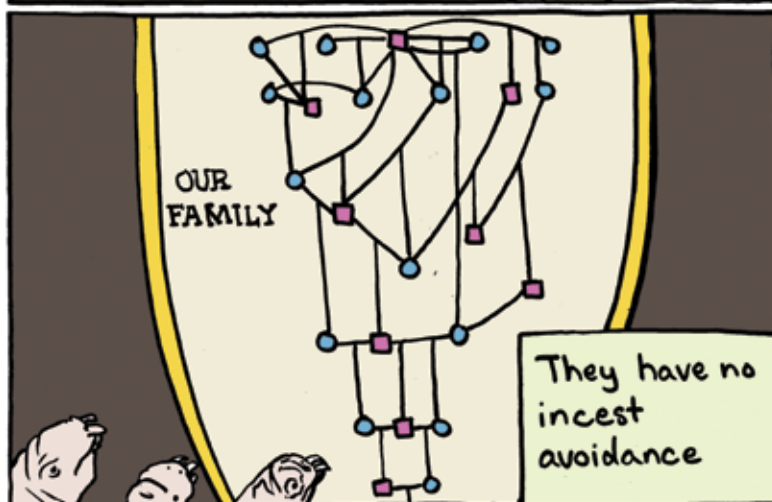
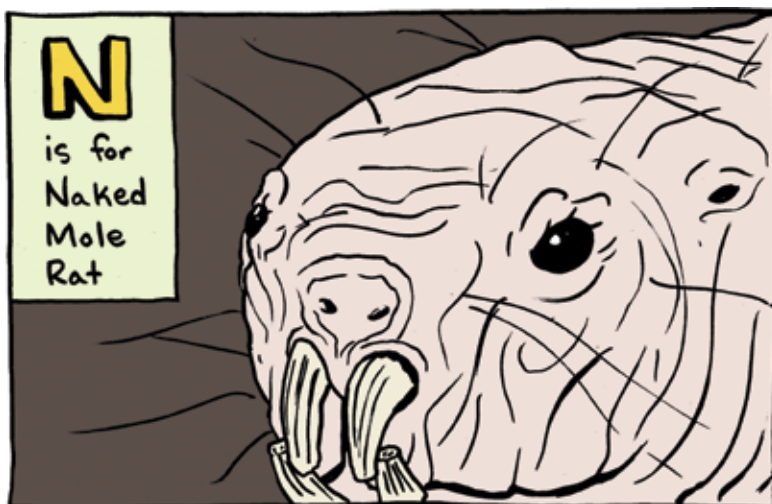


LIFE TIP:  
ALL SOCIAL HIERARCHY RULES LOOK  
STUPID OVER EVOLUTIONARY TIME.











END!



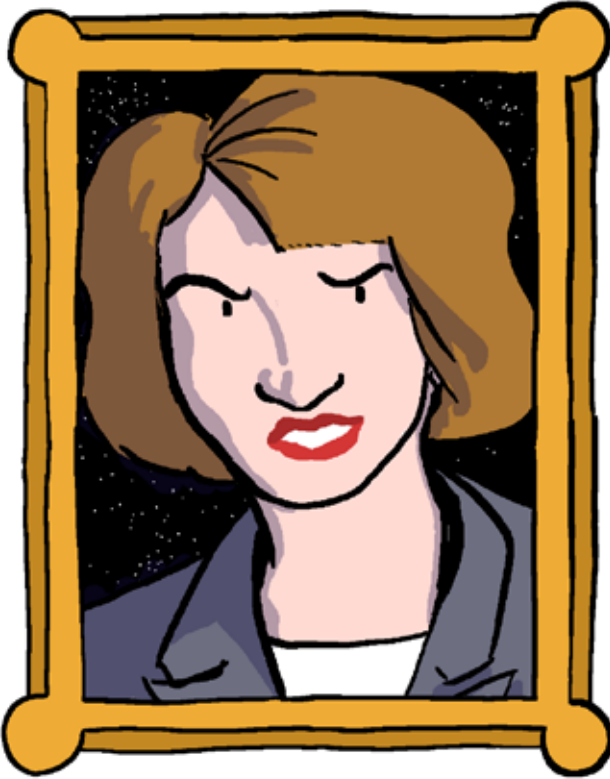
Causing our evolution teacher to explode was remarkably easy.



## BEHOLD OUR TALES OF SCIENCE!

When we decided to make a science-themed book, we wanted to make some exclusive, special content to supplement it. Since so many of the jokes in this book are inspired by the friendships (and marriages!) we're lucky enough to have with amazing scientists, we thought we'd share some of their stories about science with you. Some of them are funny, some are sweet, some are disgusting. Really disgusting. Christina Agapakis's story is really disgusting.

We hope you enjoy these Tales of Science, and we encourage you to follow these geeks online in their present and future endeavors instead of pissing away your time on comics.



# EMILY

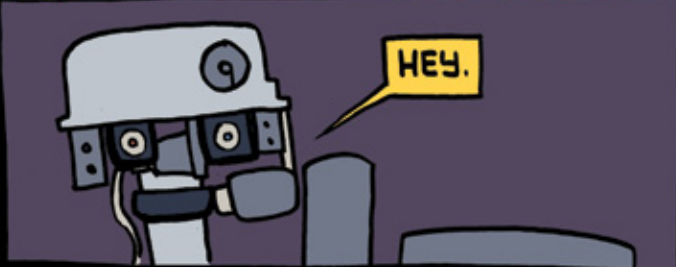
# LAKDAWALLA

**SENIOR EDITOR AND PLANETARY EVANGELIST  
THE PLANETARY SOCIETY**

AMONG MY MOST TREASURED EXPERIENCES IS THE OPPORTUNITY I HAD TO VISIT THE CLEAN ROOM WHERE CURIOSITY'S CONSTRUCTION NEARED COMPLETION.



BEING A FAN OF THE SPRIGHTLY SWEPT-WINGED SPIRIT AND OPPORTUNITY, I'D HAD A HARD TIME LIKING CURIOSITY, WHICH IS COMPARATIVELY GROTESQUE-HEAD SPROUTING FROM THE RIGHT SHOULDER, CLUB-HANDED ARM FROM THE LEFT, THE ENORMOUS BUTT OF THE RTG<sup>#</sup> STUCK ON LIKE AN AFTERTHOUGHT.



#RADIOISOTOPE THERMOELECTRIC GENERATOR. DUH.

I COVERED UP IN THE "BUNNY SUIT" AND STEPPED INTO AN AIRLOCK WHERE JETS BLASTED AWAY ERRANT DUST PARTICLES. THE ROOM WAS HUGE AND CURIOSITY WAS AT THE OPPOSITE SIDE. IT TOOK, LIKE, EIGHT STRIDES TO COVER THE DISTANCE.



IN THE FIRST COUPLE STRIDES, I WAS THINKING "IT IS SO AWESOME THAT I GET TO BE INSIDE THIS PLACE!"



NEXT COUPLE STRIDES, AND I WAS LIKE "LOOK AT ALL THOSE WIRES — THIS MACHINE IS INCREDIBLY COMPLICATED."



ANOTHER COUPLE OF STRIDES, AND IT HIT ME LIKE A BOARD UPSIDE THE HEAD — THIS MACHINE WILL SOON BE LEAVING THIS PLANET FOREVER. IT WILL LEAVE US BEHIND AND TRAVEL TO MARS. IT'S A MARTIAN.





LAST COUPLE STRIDES AND I WAS LOOKING UP -WAY UP- AT CURIOSITY'S "FACE," ITS BULGING BROW AND LOPSIDED EYES, AND I FELL IN LOVE WITH HER, RIGHT THEN AND THERE.



I WAS ALLOWED NEARLY AN HOUR IN THERE TO ASK QUESTIONS OF THE ENGINEERS. I ASKED ONE OF THEM WHETHER THEY THOUGHT OF THE ROVER AS "IT" OR AS "SHE." HE TOLD ME THAT, FOR NOW, MOST PEOPLE CALLED CURIOSITY "IT."



THEN HE SAID SOMETHING I'LL NEVER FORGET.





END!



# HENRY REICH

CREATOR OF *MINUTEPHYSICS*  
AND *MINUTEEARTH*

WHEN I VISITED MY FRIEND DESTIN IN ALABAMA, WE WENT TO THE U.S. SPACE AND ROCKET CENTER. IT'S LIKE THE SMITHSONIAN AIR AND SPACE MUSEUM, EXCEPT THERE'S NO ONE ELSE AROUND AND YOU CAN CLIMB ON STUFF.



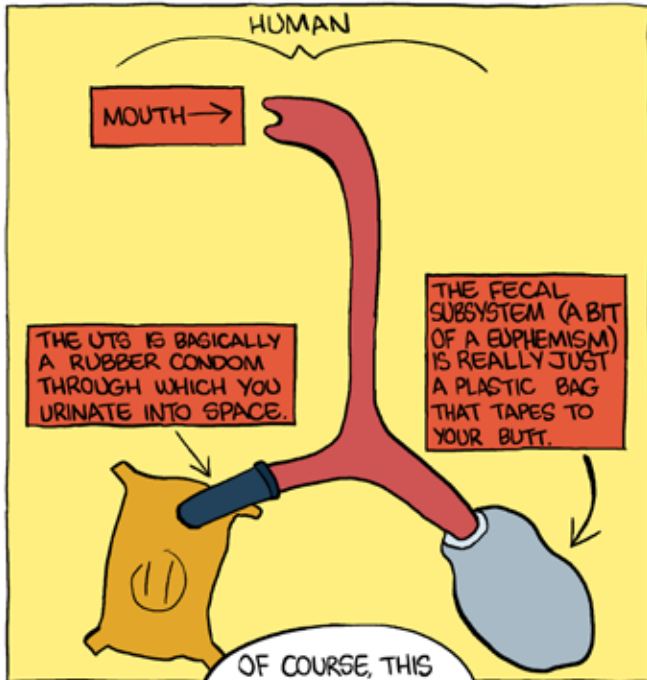
AND WHILE WE WERE GAWKING AT THE TWO FULL-SIZE SATURN V ROCKETS, SOMETHING CAUGHT OUR INTEREST.



AS A KID, YOU LEARN ALL ABOUT THE AWESOME PARTS OF SPACE EXPLORATION: ABOUT MOONWALKS AND DOCKING WITH SOVIETS AND THE HARROWING TALE OF APOLLO 13.



BUT FOR SOME REASON, YOU DON'T HEAR NEARLY AS MUCH ABOUT PEEING AND POOPING IN SPACE. THAT'S PROBABLY WHY, AFTER OGLING THE LUNAR EXCURSION MODEL DISPLAY, WE STOPPED IN OUR TRACKS.



OF COURSE, THIS DIAGRAM IS A BIT IDEALIZED.



AS WE STOOD BEFORE A PHOTOGRAPH OF THE U.S. FLAG—THE FLAG PLANTED PROUDLY ON THE MOON, SYMBOLIZING THE BOLDEST ENDEAVOR HUMANKIND EVER UNDERTOOK—WE NOTED THAT THE LUNAR LANDER'S DESCENT STAGE WAS STILL IN THE SEA OF TRANQUILITY.



AND WE SUDDENLY BECAME AWARE OF ONE AMAZING, STUPENDOUS FACT.



END!



# SEAN CARROLL

THEORETICAL PHYSICIST  
CALIFORNIA INSTITUTE OF TECHNOLOGY

AT THE END OF 1992, I WAS APPLYING FOR POSTDOCS. AMONG THE PLACES I APPLIED WAS CAMBRIDGE.



AS IT HAPPENED, A JOB CAME OVER THE PHONE WHILE I WAS OUT OF THE OFFICE.



THE CALL WAS FROM STEPHEN HAWKING.

*NO ONE MISSES  
A CALL FROM HAWKING.  
NO ONE.*



FORTUNATELY MY FRIEND BRIAN WAS IN THE OFFICE AND TOOK THE CALL FOR ME.



YEAH RIGHT. AND I'M THE QUEEN OF ENGLAND. WHAT? NO, MY VOICE HASN'T CHANGED. THAT WAS A JOKE.





DESPITE MY TEMPTATION, I ENDED UP TURNING IT DOWN FOR MIT. THREE YEARS LATER, I WAS AGAIN APPLYING FOR POSTDOCS.



AGAIN, I WAS OFFERED A JOB AT CAMBRIDGE, BUT WITH SOME REGRETS, I DECIDED THAT SANTA BARBARA WAS A BETTER PLACE FOR ME.



HOWEVER, HAWKING VISITS SANTA BARBARA EVERY YEAR, I MET ONE OF HIS GRAD STUDENTS RAPHAEL BOUSSO (NOW A GREAT PHYSICIST IN HIS OWN RIGHT) AND ASKED HIM TO INTRODUCE US.



I THINK IT'LL BE LESS AWKWARD IF YOU DO IT.

SURE.



I MENTIONED THAT I HOPED DR. HAWKING WASN'T ANGRY THAT I'D TURNED HIM DOWN. RAPHAEL TRIED TO PUT ME AT EASE.



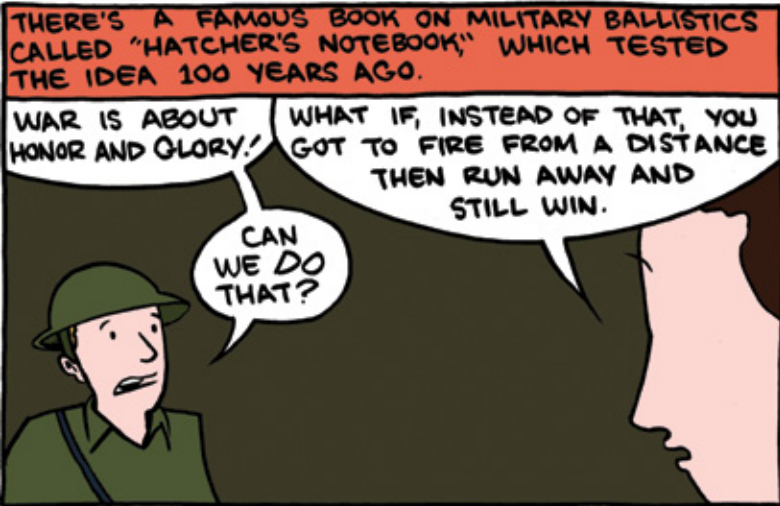


END!



# ADAM SAVAGE

MASTER MAKER, TELEVISION PRODUCER, AND  
HOST OF *MYTHBUSTERS*



**THEY SET UP A PROCEDURE WHERE THEY WENT TO A LAKE, ASSUMING THEY COULD HEAR BULLETS LAND, THEN FIRED ABOUT 500 ROUNDS INTO THE AIR. THE END RESULTS WERE NOT PROMISING.**

beach. Here it proved impossible to locate any of the returning shots, until a system of sounding balloons was used to plot the winds aloft, which were usually found to be reversed in direction from what they were at the ground level.

The firing platform at Miami was about ten feet square. There was a shield of thin armor plate over the heads of the men at the gun.

Out of more than 500 shots fired after adjusting the gun so as to bring the shots as nearly as possible onto the platform, only 4 shots hit it, and one more fell into the boat.

One of the shots that hit the platform was a Service .30-'06, 150-grain flat based bullet, which came down base first, (as that bullet usually does), and bounced into the water after striking the edge of the lower platform. It left a mark about 1/16 inch deep in the soft pine board.



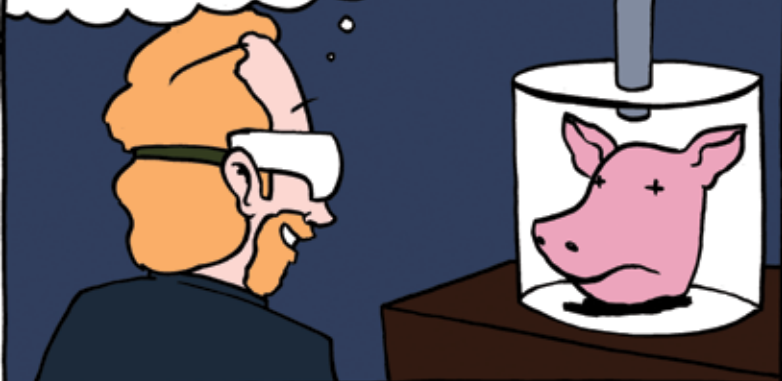
WE TRIED SOME SHOP TESTS TO SEE IF A FALLING BULLET WOULD BE LETHAL, LIKE HAVING THE BULLETS FLOAT IN WIND TUNNELS.

WE'VE GOT TERMINAL VELOCITY!  
AND LOOK! IT FLOATS ON ITS SIDE! SCIENCE!



FIRING IT AT TERMINAL VELOCITY AT A PIG'S HEAD...

AHH, TRUSTY OLD PIG HEAD.  
NATURE'S DEAD GUY.

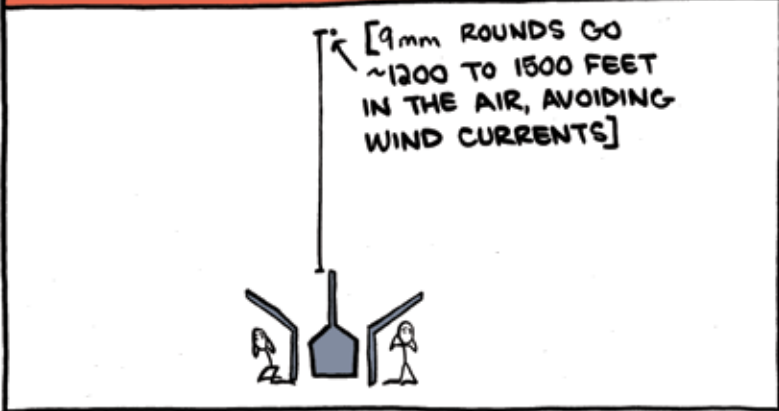


AND DROPPING BULLETS FROM A BALLOON.

I FEEL LIKE AN  
18<sup>TH</sup> CENTURY  
SUPERVILLAIN.



BUT THE TESTS WEREN'T FULL SCALE. SO, WE WENT OUT TO THE DESERT, HAD OUR PEOPLE SAFE UNDER STEEL COVERS, THEN PREPARED 9mm ROUNDS.



WE WAITED FOR CALM WINDS AND FIRED 11 ROUNDS AS FAST AS WE COULD, THEN CALLED OUT LANDING TIMES.



BASED ON WHO HEARD WHAT, WE WERE ABLE TO FIGURE APPROXIMATE LANDING SPOTS. THAT AND SEVERAL HOURS OF SEARCHING TURNED UP SIX OF ELEVEN ROUNDS.



WHEN WE DID THE REAL TEST, EVERY ONE OF THE SIX BULLETS MADE A BULLET-SHAPED HOLE SIX INCHES INTO THE GROUND, JUST AS PREDICTED. THE RESULTS PERFECTLY CORROBORATED OUR LAB TESTS.

THEY SAID I WAS  
MAD! MAD!



LOOKING BACK OVER HATCHER'S NOTES, WE WERE AMAZED HOW SIGNIFICANT OF AN IMPROVEMENT WE HAD MADE. GRANTED, WE HAD SMALL SAMPLE SIZES AND THEIR GROUP WAS WORKING IN THE 1920s, BUT IT WAS THE FIRST TIME WE REALIZED WE WERE DOING ACTUAL SCIENCE.

WE'RE CONTRIBUTING  
TO THE BODY OF  
HUMAN KNOWLEDGE.



TO THIS DAY, IT REMAINS ONE OF MY FAVORITE EXPERIMENTS.

SCIENCE! IT'S SCIENCE!  
HAHAHAHAHA!

CALM DOWN, ADAM.  
YOU'RE SCARING US.

HAHAHAHAHA!



END!





# DR. PHIL PLAIT

ASTRONOMER AND CREATOR OF  
*THE BAD ASTRONOMY BLOG*

I HAVE A DIFFERENT KIND OF TRADITION FOR HALLOWEEN. EVERY OCTOBER 31, I TAKE A BUCKET OF CANDY TO THE END OF MY DRIVEWAY.



NEXT TO IT - IF IT'S CLEAR OUTSIDE - I SET UP MY TELESCOPE. WHEN KIDS COME AROUND, I TELL THEM THEY HAVE TO LOOK THROUGH THE TELESCOPE FIRST TO GET A PIECE OF CANDY.



WELL, A FEW YEARS BACK I LIVED ON THE EDGE OF A TOUGH NEIGHBORHOOD, AND HALLOWEEN WOULD BRING THE SOMEWHAT MORE SUSPECT TEENAGERS TRICK-OR-TREATING.



ONE YEAR, SATURN WAS VISIBLE LOW TO THE WEST. THROUGH THE TELESCOPE IT WAS PERFECTLY CLEAR AND CRISP, A PLANETARY BAUBLE, THE RINGS AND ONE MOON SERENELY HANGING IN THE EYEPIECE.



WHEN THOSE TOUGH KIDS CAME BY, I'D MAKE THEM LOOK THROUGH THE 'SCOPE, AND EVERY TIME, FOR EVERY ONE, WHEN THEY SAW SATURN, THEY'D GASP AND SAY

WOW.



THEY DROPPED EVERY ASPECT OF BEING COOL AND TOUGH AND JADED, AND FOR A MOMENT, A REAL MOMENT, THEY WERE IN AWE.



I'VE BEEN AN ASTRONOMER SINCE I WAS A KID,  
AND I'VE DEVOTED MY LIFE TO SPREADING MY  
OWN LOVE FOR SCIENCE TO EVERYONE WHO WILL LISTEN.



AND FOR AS LONG AS I LIVE, THAT DAY WILL  
ALWAYS BE MY FAVORITE.



END!



# ED YONG

SCIENCE WRITER,  
*NOT EXACTLY ROCKET SCIENCE*

IF YOU WALK DOWN THE STREET WHERE DAVID ATTENBOROUGH LIVES, IT'S OBVIOUS WHICH HOUSE BELONGS TO HIM.



CARTOONIST'S NOTE : MILD EXAGGERATION

I HAD COME THERE ON A JANUARY MORNING IN 2008 TO INTERVIEW A MAN WHOSE VOICE IS SYNONYMOUS WITH NATURAL HISTORY. HE HAD NURTURED MY LOVE OF SCIENCE AND NATURE EVER SINCE I WAS A CHILD WATCHING "LIFE ON EARTH."

WOWWWW...



I'D WON THE DAILY TELEGRAPH'S COMPETITION FOR BUDDING SCIENCE WRITERS, AND ONE OF THE PRIZES WAS A MEAL WITH THE JUDGES. SIR DAVID WAS ONE OF THEM. WE TALKED NATURAL HISTORY FOR A FEW HOURS, AND I WATCHED HIM AND RICHARD FORTEY COMPETITIVELY CLASSIFY THEIR SEAFOOD PLATTER.

LUTJANUS CAMPECHANUS.

PROBABLY PARASITIZED BY CYMOTHOA EXIGUA.

WHOSE HYPERPARASITE IS

THIS IS THE GREATEST MOMENT OF MY LIFE.

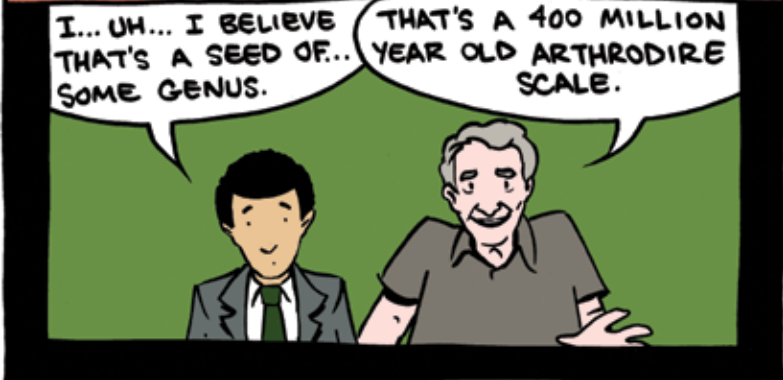


AT THE END, I ASKED HIM FOR AN INTERVIEW, AND TO MY SURPRISE, HE SAID YES. EVEN MORE UNEXPECTEDLY, HE TOLD ME TO COME TO HIS HOUSE.



At solstice time  
Upon a furrow  
The sun will light  
A rabbit's burrow.  
To occident  
To apices thorough  
You'll find the name  
Of Attention

AMID A SURPRISINGLY MODERN SPACE FULL OF CLEAN LINES AND AN ABSOLUTELY GIGANTIC TELEVISION, THERE'S A ROW OF FOSSILS, WHICH HE CHALLENGED ME TO CLASSIFY. I FLUBBED THE FIRST ONE.



I... UH... I BELIEVE THAT'S A SEED OF... SOME GENUS.

THAT'S A 400 MILLION YEAR OLD ARTHRODIRE SCALE.

BUT MERCIFULLY, I IDENTIFIED THE SECOND AS A SET OF VERTEBRAE.



INDEED. THEY BELONGED TO AN ICHTHYOSAUR, A MARINE CONTEMPORARY OF DINOSAURS. I FOUND IT IN A FRIEND'S GARDEN.

YOUR FRIENDS ARE A LOT COOLER THAN MINE.



EARLIER, I HAD CHALLENGED MYSELF TO ASK HIM A QUESTION NO ONE HAD ASKED HIM BEFORE.



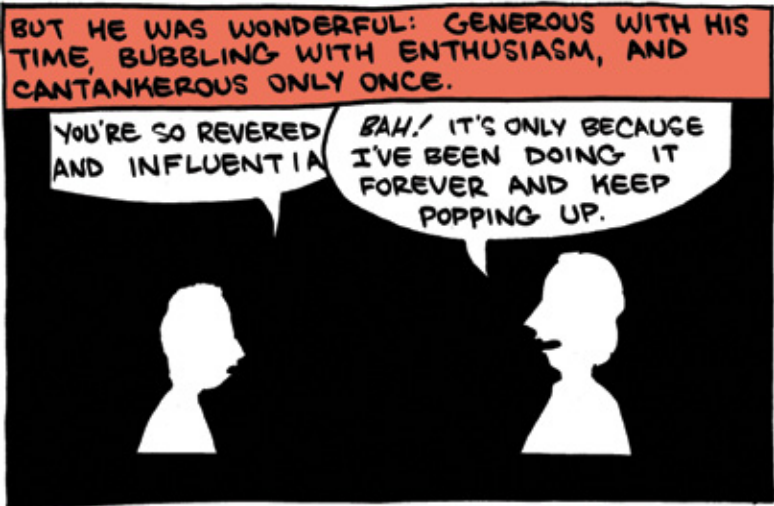
AFTER A LONG PAUSE, HE TOLD A STORY ABOUT FAILING TO FIND BIRDS OF PARADISE IN NEW GUINEA BACK IN 1965 BECAUSE THE INDONESIAN GOVERNMENT THOUGHT HIS CREW WERE SPIES.



THIS WAS MY FIRST BIG INTERVIEW, AND I HADN'T QUITE MASTERED THE ART OF LISTENING TO ANSWERS, THINKING ABOUT NEW QUESTIONS ON THE FLY, AND SUPPRESSING THE MAJORITY OF YOUR BRAIN.







END!



# ELIZABETH IORNS, PH. D.

CO-FOUNDER,  
THE SCIENCE EXCHANGE

WHEN I WAS DOING MY POSTDOC RESEARCH, I WAS WORKING ON A NEW TECHNIQUE (FLOW CYTOMETRY) THAT I WAS NOT AN EXPERT IN.



ALTHOUGH WE HAD A FLOW CYTOMETRY CORE FACILITY, IT WAS SELF SERVICE SO I HAD TO LEARN HOW TO DO MY VERY COMPLICATED MULTICOLOR LABELING EXPERIMENT MYSELF.



EACH TIME I HAD TO SET UP THE EXPERIMENT AND LABEL THE CELLS, IT TOOK ABOUT 48 HOURS OF WORK. UNFORTUNATELY FOR ME, IT TOOK THREE SEPARATE ATTEMPTS BEFORE I MANAGED TO GET THE LABELING RIGHT AND INCLUDE ALL THE RIGHT CONTROLS.



THIS WAS OBVIOUSLY NOT A GREAT USE OF TIME OR RESOURCES: IF THERE HAD BEEN AN EXPERT WHO WAS WILLING TO DO MY EXPERIMENT FOR ME ON A FEE FOR SERVICE BASIS, EVERYONE WOULD HAVE BEEN MUCH BETTER OFF.

I HAVE THIS CRAZY IDEA. WHAT IF YOU COULD PAY MONEY IN EXCHANGE FOR SERVICES?

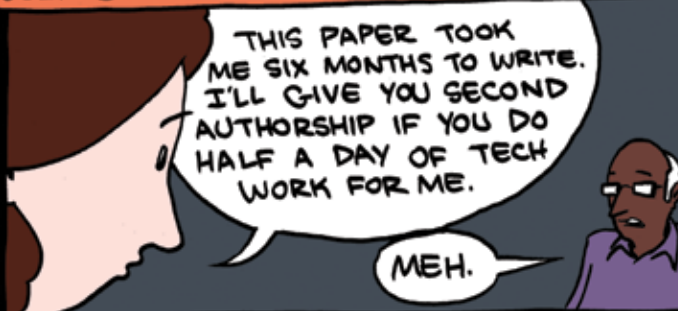
YOU OBVIOUSLY HAVEN'T BEEN IN ACADEMIA LONG.



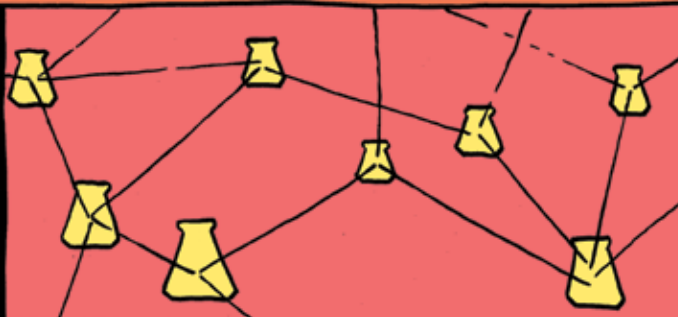
IN THE ACADEMIC SYSTEM, I WOULD HAVE HAD TO BARTER CO-AUTHORSHIP OR SOME OTHER FAVOR TO GET SOMEONE TO DO MY EXPERIMENT FOR ME. SINCE EVERYONE HATES FLOW CYTOMETRY, THAT WOULD BE A PRETTY BIG FAVOR.

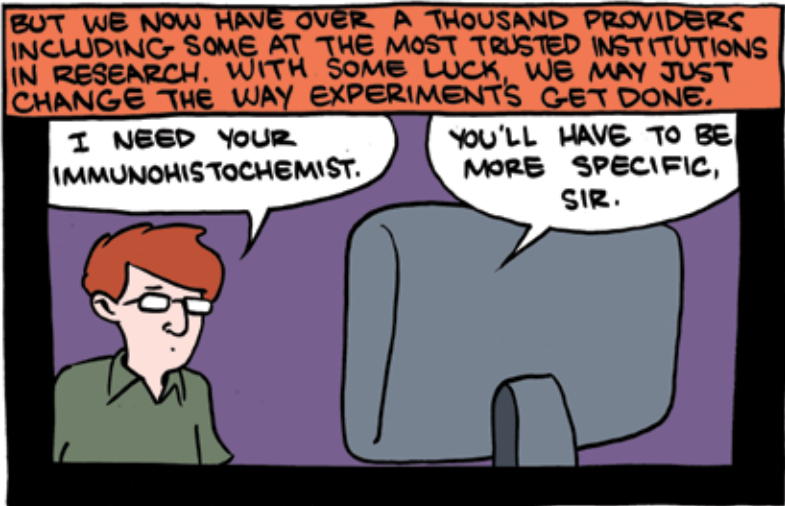
THIS PAPER TOOK ME SIX MONTHS TO WRITE. I'LL GIVE YOU SECOND AUTHORSHIP IF YOU DO HALF A DAY OF TECH WORK FOR ME.

MEH.



THIS EXPERIENCE LED ME TO CREATE SCIENCE EXCHANGE: A MARKETPLACE TO SELL YOUR EXPERTISE AND SERVICES. SCIENTISTS GET SERVICES CHEAPER AND MORE EASILY, AND CORE FACILITIES GET USED MORE EFFICIENTLY.





**END!**



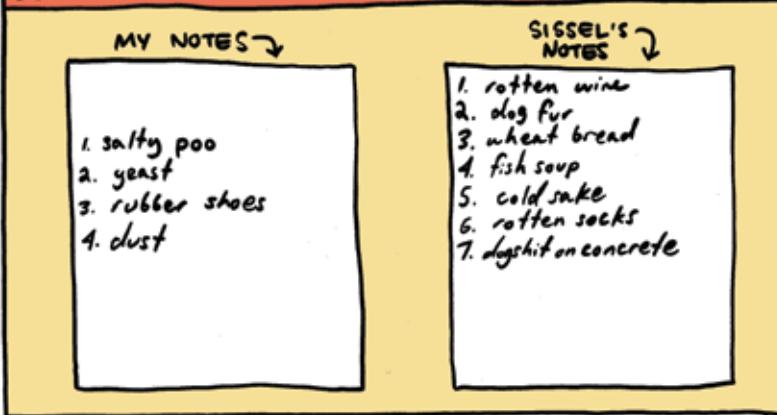
# CHRISTINA AGAPAKIS

POSTDOCTORAL RESEARCHER AT  
UNIVERSITY OF CALIFORNIA, LOS ANGELES

WORKING WITH AN ODOR ARTIST MADE ME SEE AND SMELL THE LAB IN VERY DIFFERENT WAYS. WE WOULD WALK AROUND THE LAB, OPENING UP TEST TUBES AND PETRI DISHES, SMELLING ALL THE MICROBES GROWING IN THE INCUBATORS.



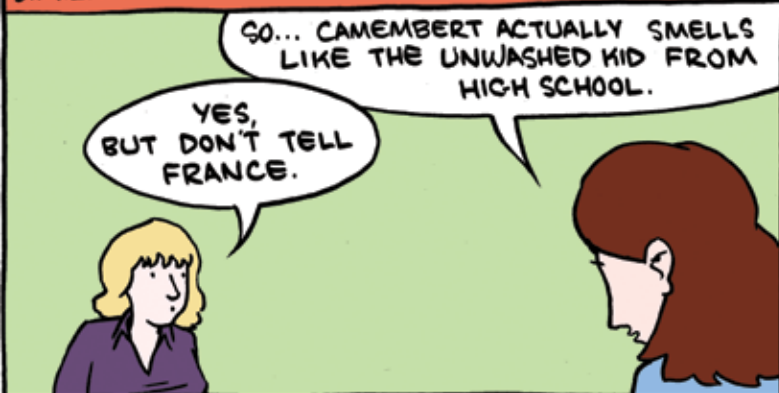
SMELLING WITH A SMELL EXPERT MEANT THAT I HAD TO LEARN TO DESCRIBE ODORS MORE POETICALLY, BEYOND JUST "SMELLS LIKE E. COLI."



I ALSO HAD TO LEARN THAT BACTERIA DON'T SMELL "GROSS." THEY HAVE A SMELL WE OFTEN ASSOCIATE WITH THINGS WE CONSIDER GROSS.



THE MORE WE RESEARCHED THE SMELLS OF BACTERIA, THE MORE I SAW HOW TRUE THIS IS. THE BACTERIA RESPONSIBLE FOR BODY ODOR AND THE SMELL OF FEET ARE VERY SIMILAR TO THE BACTERIA THAT FLAVOR CHEESE.



EVEN THOUGH THE BACTERIA AND SMELL MOLECULES ARE ALMOST IDENTICAL, IT IS VERY GROSS TO SMELL LIKE CHEESE BETWEEN YOUR TOES, BUT VERY CIVILIZED TO APPRECIATE A CHEESE THAT SMELLS LIKE FEET.



TO EXPLORE THE ART AND SCIENCE OF CHEESE AND SKIN BACTERIA, WE MADE CHEESE WITH OUR OWN MICROBES, SAMPLED FROM BETWEEN TOES AND UNDER ARMS.





THE RESULTS SMELLED LIKE SOUR OLD CHEESE, OCEAN SALT, CAT FEET, FRESH CREAM, LIGHT PERFUME, AN OLD SUBWAY STATION, A CHEESE FACTORY, OR ORANGE JUICE LEFT IN THE FRIDGE TOO LONG.



WE WANTED THESE STINKS TO MAKE YOU THINK— ABOUT ALL THE BACTERIA IN YOUR LIFE. THE BACTERIA THAT HARM. THE BACTERIA THAT HELP.



AND THE BACTERIA THAT MAKE CHEESE DELICIOUS.



END!



# DR. PAUL BARRETT

DINOSAUR RESEARCHER  
THE NATURAL HISTORY MUSEUM, LONDON

IN 1916, A SET OF DINOSAUR BONES FROM THE BADLANDS OF ALBERTA, CANADA WAS SENT TO THE NATURAL HISTORY MUSEUM BY FOSSIL COLLECTOR C.H. STERNBERG.



ARTHUR SMITH WOODWARD, HEAD OF THE MUSEUM'S FOSSIL COLLECTION, WAS LESS THAN IMPRESSED WITH THE COLLECTION, WRITING TO STERNBERG THAT "...IT CONTAINS NOTHING BUT RUBBISH."



AS A RESULT, THE FOSSILS WERE STORED AWAY IN THE BASEMENT WITH ONLY A FEW PARTS BEING UNWRAPPED, THE MAJORITY STAYING IN THE PLASTER CASTS IN WHICH THEY'D BEEN COLLECTED FROM THE BADLANDS.





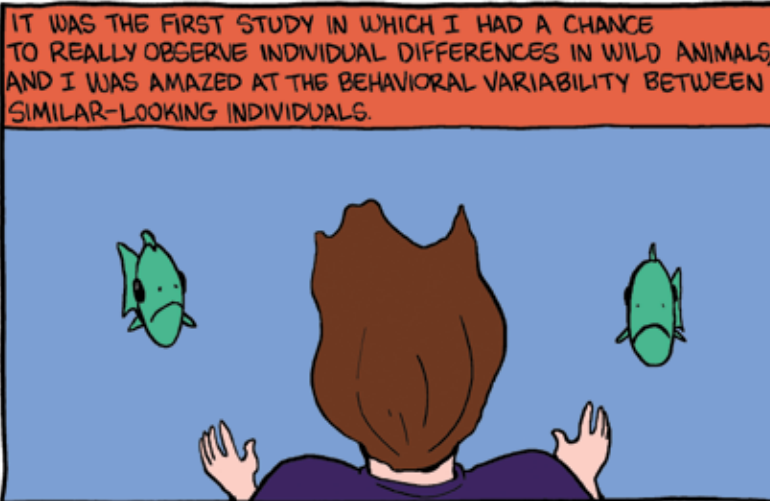


**END!**



# KELLY WEINERSMITH

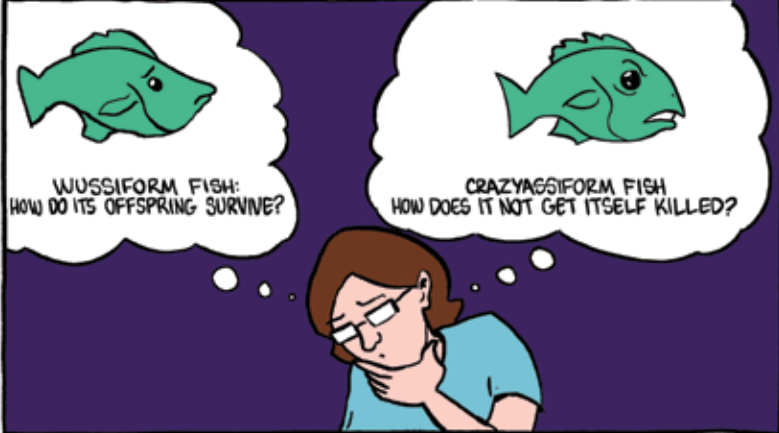
PH. D. STUDENT  
UNIVERSITY OF CALIFORNIA, DAVIS



OTHERS WOULD SLAM INTO MY MASK, THEN GRAB MY FINGER AND TRY TO PULL ME AWAY.



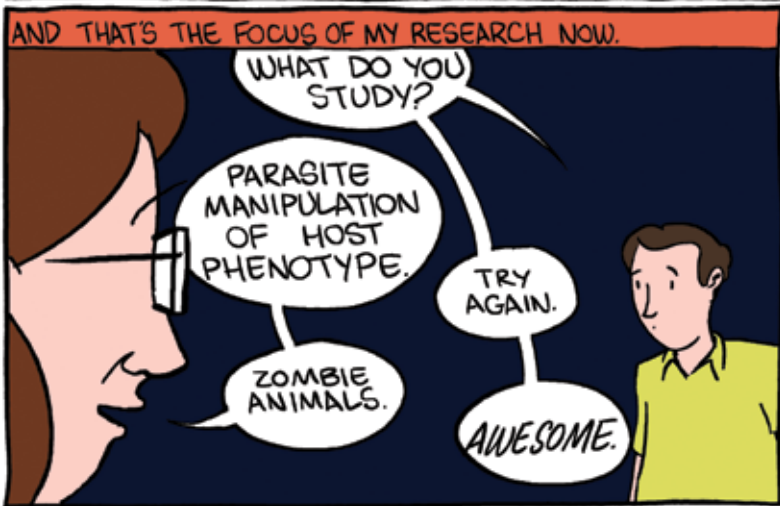
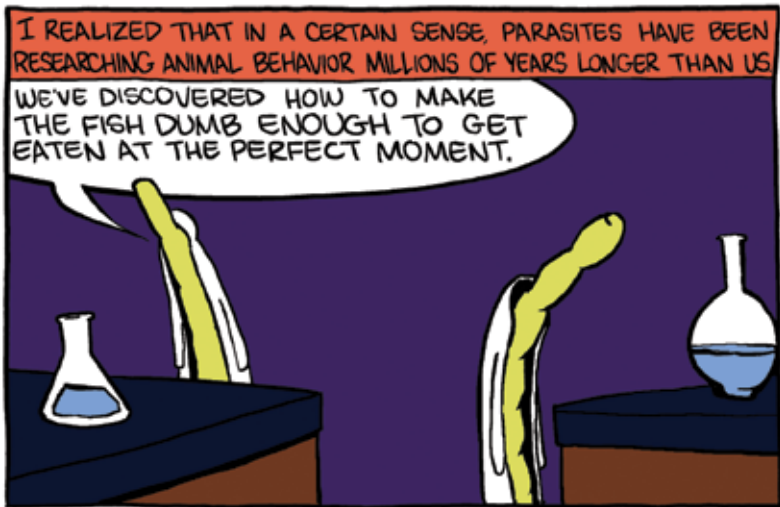
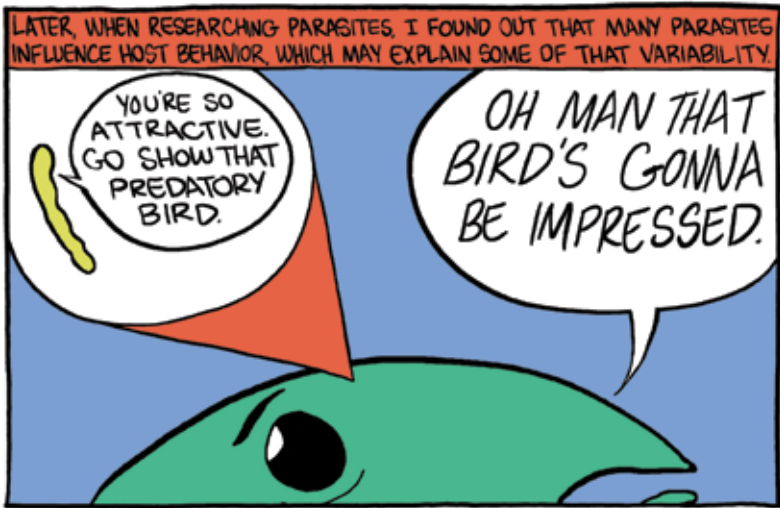
IT WAS AMAZING TO ME THAT BOTH EXTREMES COULD BE PRESENT IN A POPULATION.



IT GOT ME REALLY EXCITED ABOUT BEHAVIORAL VARIATION, THE MECHANISMS UNDERLYING IT, AND THE FITNESS CONSEQUENCES.







END!



**breadpig**

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