

Science and Technology Songs

Handout for Rainy Camp 2020. Version 1.0

Gravity and levity, from Amphioxus to the Xerox line.

(Don't feel limited to these - they are just some examples.)

Science song index: singaboutscience.org

Recommended artists: Tim Griffin, Tim Blais, ZDoggMD, Dr. Carl Winter, ASAPScience, J. Berliner, Steve Savitsky

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Amphioxus song (It's a long way from Amphioxus) Music: It's a Long, Long Way to Tipperary Words: Philip H. Pope, 1921
<http://evolution.gs.washington.edu/amphioxus/>

A fish-like thing appeared among the annelids one day.
 It hadn't any parapods nor setae to display.
 It hadn't any eyes nor jaws, nor ventral nervous cord,
 But it had a lot of gill slits and it had a notochord.

It's a long way from Amphioxus. It's a long way to us.
 It's a long way from Amphioxus to the meanest human
 cuss.
 Well, it's goodbye to fins and gill slits, and it's welcome
 lungs and hair!
 It's a long, long way from Amphioxus, but we all came
 from there.

It wasn't much to look at and it scarce knew how to swim,
 And Nereis was very sure it hadn't come from him.
 The mollusks wouldn't own it and the arthropods got sore,
 So the poor thing had to burrow in the sand along the shore.

He burrowed in the sand before a crab could nip his tail,
 And he said “Gill slits and myotomes are all to no avail.
 I've grown some metapleural folds and sport an oral hood,
 But all these fine new characters don't do me any good.”

(chorus)

It sulked awhile down in the sand without a bit of pep,
 Then he stiffened up his notochord and said, “I'll beat 'em yet!
 Let 'em laugh and show their ignorance. I don't mind their
 jeers.
 Just wait until they see me in a hundred million years.”

My notochord shall turn into a chain of vertebrae
 And as fins my metapleural folds will agitate the sea.
 My tiny dorsal nervous cord will be a mighty brain
 And the vertebrates shall dominate the animal domain.

(chorus)

Archimedes (The Lever) Tune: Leave Her Johnny Words: Nat Case <http://www.thedance.net/~roth/SONGS/archimedes.html>

Oh the inclined plane, it launched our ship
 And the screw, it may well sink her
 And the pulleys we pull in the rigging all day
 But what about the lever?

The lever, boys, the lever,
 Oh, the lever, boys, the lever
 Not the pulley nor the screw
 Nor the inclined plane

It's time to use the lever!

When the grog it is brought up on deck,
 Our thirst, it's a reliever
 And the bung won't leave the bunghole, then
 It's time to use the lever!

Archimedes, he is dead and gone
 May God be his receiver

Then we'll dig his grave with a silver spade

Which, in fact, is just a lever!

BANTING'S IMPARTED YEARS Music: Barrett's Privateers, Stan Rogers Words: Tim Blais (acapella science)

Oh the year was nineteen, ten and eight
And to think I take up sugar now
At eleven years old my fate was rung
By the death o' me islets of Langerhans

The pancreas' form had long been known
And to think I take up sugar now
Islets that curb sugar low or high
And digestive fluid from the acini

Nobel them all!
I was lost to cruel disease
When a miracle cure saved mother her son
Dried her tears
Now I'm a croakin' man but I'll nevermore fear
The last of Banting's imparted years

He worked as long I withered and waned
And to think I take up sugar now
Sweating with Best in animal trials
To wring an elixir from the tiny isles

Diabetes then was a sickening plight
And to think I take up sugar now
We'd down the least that a man could scoff
'Til the famine or saccharide capped us off

Then at length on death's cold mantle I lay
And to think I take up sugar now
The extract was drawn and the hype went in
In the first e'er treatment of insulin

Fred Banting was a knife by trade
And to think I take up sugar now
When the practice failed he set his jaw
To the treatment of glycosuria

My vigour returned and in truth I thrived
And to think I take up sugar now
Banting & co shared a Nobel prize
And the work saved north'ard of a million lives

So here I lay in my twenty-eighth year
And to think I take up sugar now
The pneumonia's fast in both me lungs
But I want no islets of Langerhans

Best Part Of Science (The) By Tim Griffin copyright 2018

Back in the ancient days, you know, when the winds began to
blow
And the clouds up in the sky began to blacken
All the folk were badly frightened; was it Neptune or
Poseidon?
Were they fightin' with a titan or a kraken?

Back in the ancient days when millions of people died of
illnesses
Like polio, pertussis, and rubella
We imagined horrid horsemen who would gallop on their
course and
Make a corpse out of a lady or a fella

Then the lightning would flash and a thunderclap would crash
Was is Zeus or maybe Set or Feng Po Po?
Maybe Thor or Dionysus would accept our sacrifices
But we really didn't have a way to know

We could try to help our odds, sacrificing to the gods
Making ointments out of rhino horn and poo
And a lot of people thought that it was working; it was not
But we didn't have a method yet for testing what was true.

Until some people wondered whether we could understand the
weather
And together, started studying the air
We began to build barometers and mercury thermometers
Hygrometers for knowledge we could share

But today, if you get ill with a fever or a chill
Modern doctors make a careful diagnosis
And instead of making guesses we've got rigorous
processes
For prevention, predication and prognosis

We collected lots of data and began to find a way to
Say just what we think the weather's gonna do
And now instead of mere mythology we've got meteorology...
Because the best part of science is it's true.

While with modern sanitation and effective vaccinations
We have saved entire nations from their graves
Because instead of mere mythology we've got
microbiology...
And the best part of science is it saves. (lives that is)

So when you come across a fossil of a creature that's colossal
Or you see a star that's moving in the sky
Don't assume that it's a fairy or a dragon mean and scary
You can understand what's happening if you try

Because a myth's an allegory but you know it's just a story
So enjoy it for the way it makes you feel
Ah, but when you start to wonder why the lightning and the
thunder...
The best part of science, my favorite part of science,

The greatest part of science is it's real... whether you
believe in it or not.

Code Tune: Men of Harlech ("Woad") Words: Bob Kanefsky © 3/7/86

What's the use of incantations
Needing strange gesticulations,
Eye balls of obscure crustaceans,
Toe nails of a toad?

Oftentimes a poor old biddy
Found on her familiar kitty
Ticks and fleas, which (more's the pity)
Moved into her rugs.

What's the use of years of training,
Spells that don't work when it's raining
Or because the moon is waning?
Better far is Code!

Shamans using dung from cattle
With small insects must do battle.
We have code to serve us that'll
Not be fraught with bugs.

Code's the stuff we write now.
Code that's clean and tight now.
Run it through your Apple II
(Try not to stay up fixing it all night, now.)

Shaman, save your tonic;
Witch, your pets bubonic.
We've the means, with our machines,
To make phantasms visual and sonic.

Ancient mages, through the ages
Frequently were prone to violent rages
Due to pouring over pages
Filled with ink that glowed.

If you've stayed with code that's made with
Principled techniques and not been played with,
You won't need a wizard's aid with
User-friendly code!

Don't Put Your Bottom On Facebook by: Jonny Berliner 2016 (CC BY-NC 3.0)

[Starts with chorus]
Don't Put your bottom on Facebook,
Don't Instagram things you'll regret,
If you're twisted and bitter, don't post it on Twitter,
'Cause no one will let you forget.

In the school play your Sally was singing,
And struggling to hit the right pitch,
Jo tweeted she sounds like a dying hound,
Now everyone knows Jo's a bi...g meany.

When Billy was 18, he selfied,
A picture of his bottom parts,
But now he's a grown up he still has to own up,
To the picture where he looks like an a...bsolute idiot.

Jimmy thought he was cool when they passed him the joint,
So he posed and he smiled as he sucked,
But the viewers ain't minimal of him being a criminal,
And his mother has told him he's fu...lly grounded.

It can be hard to wipe things from memory,
They will search you when you go for a job,
So think before you send, would you want your children,
To see you behave like a no...t very wholesome individual?

Tell me Why. Words: some Nameless MIT student (Printed in Isaac Asimov's Treasury of Humor, page 184)

Music: Tell me Why. Circa 1945, Words & Music by Parish, Edwards and Spaeth.

Tell me why the stars do shine,
Tell me why the ivy twines,
Tell me what makes skies so blue,
And I'll tell you why I love you.

Nuclear fusion makes stars to shine,
Tropisms make the ivy twine,
Raleigh scattering make skies so blue,
Testicular hormones are why I love you.

Don't Swear at Machinery By: Graham Leathers

Out on the highway, last Saturday night
The car made a terrible sound
It chugged and it chuffed
it gave up with a huff
I pulled over, the damn thing broke down.

Well I yelled and I lunged
and I bounded and plunged,
I was so angry, I couldn't see.
But then someone pulled over,
put his hand on my shoulder
and this is what he said to me.

Don't swear at machinery,
It never does any good
If it isn't working,
the wrench isn't helping,
What makes you think that cussing would.
Don't beat it or hit it,
You'll only upset it
That's the dumbest thing that you could do.
Don't swear at machinery
'cause it never listens to you.

Doing my laundry on Thursday last week
the drier did not do its job.
It rolled and it rocked,
and it kicked and it bucked.
It hopped round the room like a huge frog.

Dreaming of a Clean Email Tune: White Christmas Words: The Security Awareness Company
<https://www.youtube.com/watch?v=WQYxj2YnEno>

I'm dreaming of a clean email
That's from someone I really know
Not from some prince wishing
Or bad guys phishing
For my private bank info.

Well I yelled and I danced
as it spat out my pants
I was so angry, I couldn't see
But then I raised my hand
and the words of that peaceful man
suddenly came back to me.

[Chorus]

So when an appliance rebels against you,
when the fridge starts to smell gross
Don't turn on your oven,
just give it some lovin'.
Don't say that your toaster is toast.

Show no exasperation
for no carberation
Don't kick that poor washer again
Just turn yourself 'round
and go sit yourself down
and start counting backwards from ten
.. nine, .. Eight, .. **SEVEN!**

[Chorus x2]

I'm dreaming of a spam free inbox
Just like the one I used to know
Where each message has meaning
And isn't mis leading
And won't cost me lots of dough

I'm dreaming of a scam free email
That truly comes from Amazon
Let's filter all that junk mail away
No more malware to ruin my day.

Free Software Song (The) music: "Sadi moma bela loza" (Bulgarian folk song) Words: Richard Stallman

Join us now and share the software;
You'll be free, hackers, you'll be free.
[Repeat first 2 lines]

Hoarders can get piles of money,
That is true, hackers, that is true.
But they cannot help their neighbors;
That's not good, hackers, that's not good.

When we have enough free software
At our call, hackers, at our call,
We'll kick out those dirty licenses
Ever more, hackers, ever more.

Join us now and share the software;
You'll be free, hackers, you'll be free.
[Repeat first 2 lines]

Entropic Time Tune: The Longest Time Words: Tim Blais, 2016 (acapella science)

Woah arrow of entropic time
Woah arrow of entropic

If you made a scrambled egg tonight
There'd be no return to yolk and white
And when it's fried you
Can't turn it back to raw food
That is the arrow of entropic time

Structure decomposes 'til it's gone
Hot spots cool and entropy grows on
My room was cleaner
Now looks like Godzilla's been there
Not my fault; blame it on entropic time

Woah arrow of entropic time
Woah arrow of entropic

Stars explode and leaves turn brown and fall
That's thermodynamics' second Law
But from a deep view
That doesn't need to be true
Time symmetry precludes entropic time

Maybe this won't last very long
Our cosmos's light
A fluctuation
In that case it's probable we are
A brain without a jar
Decomposed in a moment

Who knows if that's true and I'll be gone
Thermalized before you hear this song
I'll take my chances
Though I can't disprove these answers
That there's a reason for entropic time

One must go right back to the start
The order from whence all things fell apart
All life hinges on the state that was
We hope to find its cause
But it's more than we know now

Maybe there's a time-symmetric space
Birthing big bangs all over the place
That then disperse as
New baby universes
With their own direction of entropic time

Woah arrow of entropic time [x2]

Galaxy Song Eric Idle and John Du Prez, 1983

Whenever life gets you down Mrs. Brown
And things seem hard or tough
And people are stupid, obnoxious or daft
And you feel that you've had quite enough...

Just, remember that you're standing on a planet that's evolving
And revolving at nine hundred miles an hour
That's orbiting at nineteen miles a second, so it's reckoned
A sun that is the source of all our power

The sun, and you and me, and all the stars that we can see
Are moving at a million miles a day
In an outer spiral arm at forty thousand miles an hour
Of the galaxy we call the Milky Way

Our galaxy itself, contains a hundred billion stars
It's a hundred thousand light years side-to-side
It bulges in the middle, sixteen thousand light years thick
But out by us it's just three thousand light years wide

We're thirty thousand light years from galactic central point
We go round every two hundred million years
And our galaxy is only one of millions of billions
In this amazing and expanding universe

The universe itself keeps on expanding and expanding
In all of the directions it can whiz
As fast as it can go, the speed of light you know
Twelve million miles a minute and that's the fastest speed there
is

So remember when you're feeling very small and insecure
How amazingly unlikely is your birth
And pray that there's intelligent life somewhere up in space
Cause there's bugger-all down here on Earth

Mushroom Song (The) by Steve Savitsky

Now everybody knows that engineers are lazy slobs
They dress in dirty T-shirts and complain about their jobs
But Management has found a way to make them toe the
mark:
You feed them bits of bullshit, and you keep them in the dark!

Because they're ... [Chorus]
Mushrooms, Mushrooms, keep them in the dark
Mushrooms, Mushrooms, I heard the boss remark
You feed them bits of bullshit til they can't take any more
When they stick their heads up cut them off and
Ship them out the door

An engineer told his manager, "This project is the pits
A stinking crock of horse manure that gives me nauseous
fits,"
The manager went to his boss and passed the word along
"It's a pot of fertilizer and its smell is awfully strong."

It comes from... [Chorus]

The word it traveled quickly 'til it reached the CEO
The VP told him gladly "This is stuff that makes things
grow
It's packaged in ceramic and it's very strong indeed;
I think that you'll agree that it's exactly what we need."

It's made with... [Chorus]

The CEO went to the board and said to them, "You know
This substance has the power to make our business grow!"
They had the news that evening on the business TV shows:
"The company is growing and it's smelling like a rose!"

They're growing... [Chorus]

The engineer he heard the news and muttered, "It's a crime
How other guys get all the nifty projects all the time
We have a real disaster here that just won't go away
'Cause no-one ever listens to a single word we say!"

Because we're... [Chorus]

We all are... [Chorus]

Organs In A Jar Tune: Whiskey In The Jar (Irish trad.) Words: Tim Griffin

Tutankhamen was a pharaoh of the land along the river
So when he died his people dried his stomach and his liver
His lungs and his intestine went into the salt of natron
Then stored in four canopic jars, each with its godly patron

When a pharaoh died
He'd be cut and dried
His body mummified, his organs in a jar

They put a hook into his nose and gently drew his brains out
Be careful where you put 'em or you'll never get the stains out
They dried him up for sixty days, it was a lot of work; he
Might once have been a mighty king but now he's just a jerky

When done with desiccation, they removed the salt he'd been
in
Then wrapped him up in resin and a hundred yards of linen
They laid him in a coffin and sarcophagus to rest in
With jars to hold his lungs and liver, stomach and intestine

They sealed him in a secret tomb with charms and wards and
curses

He rested through three thousand years and far too many
verses

The pyramids were plundered so a secret tomb was smarter
We might have never found him if it weren't for Howard
Carter

[Chorus repeat.]

Parasite Fight Song Tune: U of Michigan football fight song (The Victors by Louis Elbel) Words Tim Griffin copyright 2001

We are your parasites
Your ticks, leeches, fleas, and lice
And we find it very nice
To suck on your blood (Blood! Blood! Blood!)

We can live anywhere
Your skin, muscles, lungs or hair
But when people find us there
They start to curse and swear (How rude!)

Parasites can be germs
Bacteria, bugs, or worms
We penetrate your epidermis
Then we start to eat (Blood! Blood! Blood!)

I met a guy who had
A fifteen foot tapeworm
Growing in his intestine
From eating uncooked meat

If you want us for friends
Then please never wash your hands
Or hair so we can get in there
And ride you everywhere (Blood! Blood! Blood!)

And also when you eat
Please don't fully cook your meat
Give us a break, we're in your steak
You might kill us, for goodness' sake!

We are your parasites
Mosquitos, hookworms, flies and skin mites
We'd like to take a little bite
Out of you (Blood! Blood! Blood!)

Some people say we're vicious
But you are so delicious
That's why with every bite
We're proud to be your parasites!

Twelve bugs of Christmas. (Tune: 12 Days of Christmas)

[Listing shows what would sing for the 12th bug. Start with the bottom of the list, keep an index pointer and move up one each time.]

When the twelfth bug appeared,
My manager said to me ...

12) Tell them its a feature,
11) Say its not supported,
10) Change the documentation,
9) Blame it on the hardware,
8) Find a way around it,
7) Say they need an upgrade,
6) Reinstall the software,

5) Ask for a dump,
4) Use a debugger,
3) Try to reproduce it,
2) Ask them how they did it, and
1) See if it happens again.

Uncle Ernie's Tune: Finnegan's Wake Words Steve Savitsky, Copyright CC-by-nc-sa1985 (Charles Babbage b. Dec 26, 1792)

When Babbage's Birthday rolls around
We hold our annual Shopping Spree
With every C-P-U you buy
Get a floppy disk completely free!
We've acres of used computers here
The biggest selection in the land
At prices from just fifty cents
To seven hundred and fifty grand!

It's Uncle Ernie's Used Computers
Babbage's Birthday bargain bash
Once-in-a-lifetime discount deals
All sales are final and strictly cash!

We've Altairs, Imsais, Apple Threes
And PC Juniors by the score
And if you fancy something big
A mainframe's only slightly more!
Take that 7090 there,
Such magtape drives did y' ever see?
And whether it runs with tape or cards
Get a floppy disk completely free!

If energy bills are out of sight
Don't sit and shiver in the cold
To help you beat the cost of heat
We're offering real-time control.
Straight from the nuclear industry
Here's a real hot number just for you
It glows in the dark a little so
It makes a dandy night-light too!

Now in the robot section here
We've Heathkit Heros by the score
And a couple of custom models that
Were only used in one star war!
Robbie here is a great machine
Did you ever see such a friendly face?
The price is very low because
We found him drifting lost in space!

Why Study, [If you know author, title, etc. please tell me]

The Philosophy of Logic is the best philosophy
One simple bit of Logic, makes college life sublime
Now instead of study, we have leisure time.

Because ..
The more you study, the more you know,
The more you know, the more you forget,

The more you forget, the less you know,
So Why Study?

The less you study, the less you know,
The less you know, the less you forget,
The less you forget, the more you know,
So Why ..., why, why study?

You'd Better Wash Your Hands Music: I want to hold your hand. Words: Dr. Carl Winter

Oh yah I'll tell you something,
I think you'll understand
For the sake of sanitation
You'd better wash your hands. (x3)

Before, and after meals
And when you use the can
Soap and water, for twenty seconds
Should be part of your plan
That's how you wash your hands. (x2)

And when you're finished, you'll feel happy, deep inside [*]
Washin' so thorough that microbes
They can't hide. (x3)

Make sure you, wash your nails,
And dry with towel or fan
Prevent those nasty microbes
From spreadin' 'cross the land
You'd better wash your hands (x2)

[Optional reprise - repeat from line * to end,
then one more repeat of You'd better ...]

Why don't you wash your haaaaaaaands.

The Particle Physicists' Song, Music "Bold Hippopotamus" Flanders and Swann, Lyrics © Danuta Orłowska, 2009.

Some particle physicists were standing one day
At the Hadron Collider in CERN
They gazed at the buttons and the output display
Thought of projects they'd had to adjourn...

They dreamt of new papers, new grants and new chairs
A thirteenth dimension and more –
Those physics professors were no idle guessers
And answers there'd be they were sure...

Higgs, Higgs, glorious Higgs
The theory told them these thingumajigs
Were so fundamental
And not accidental

They got sentimental
When thinking of Higgs.

The key to the origin of mass they supposed
Was the boson they hoped would be found
By hard-working scientists who rarely reposed
And constantly rushed round and round...

Inventing, designing experiments new

To answer deep questions that seek
Where most anti-matter'd gone off to and scattered
And why gravity is so weak.

[Chorus]

They all thought of SUSY with love in their eyes
And hoped things would work out this time
Exploring the Big Bang – the ultimate prize
And a mountain of knowledge to climb.

They switched on the LHC, hoped it would start
And the data would help them decide
What actually goes on when hunting a boson
And protons with protons collide.

Higgs, Higgs, glorious Higgs
The theory told them these thingumajigs
Were so fundamental
And not accidental

They got sentimental
When thinking of Higgs.

Big Rewrite Tune: American Pie, by Don McLean Words: Dylan Beattie

A long long time ago, I wrote in assembler. Those op-codes used to make me smile.
I wrote my "hello world" program in 16 killobytes of RAM.
No function calls, no "do" or "for" or "while."
I'd sit all night in wrapped frustration, trying new optimizations.
Forgot to sleep or eat, I would not admit defeat.
Every change caused more confusion, surrounded by my own delusion.
Finally came to a conclusion. I'd do a big rewrite.

It's high time we reviewed are design
The code behind our system is just too Byzantine
We'll rewrite all the legacy and take it off-line
And It's gonna compile first time.
It's gonna compile first time.

[up-beat]

Did you have a BBC, or a Commodore, or VIC-20. 8-bits wide and slow as hell.
Or did you start out on a UNIX scene, a VMS, or a PDP.
Your own account, with e-mail and shell.
Well it's not like anyone really cares. We all got started out somewhere.
A keyboard and a screen, Listings in a magazine.
We typed those games in key by key. Convinced our code was typo-free.
But we knew that, eventually, we'd do a big rewrite.

We were singing [Chorus]

Now for 10 years we've been running code in PHP and Rust and Node,
But that's not how it used to be.
When I learned to code, it was a different age. Turbo Pascal was all the rage.
And we couldn't wait to install Windows 3.
Well 640k of memory should be enough for any body. Multi-tasking code had run protected mode.
You'd work with your bible by your side. Peter Norton's "MS-DOS guide."
But you'd already worked out deep inside, you'd do a big rewrite.

We started singing [Chorus]

Dial-up modems straining to upload-em. Spitting out sites as fast as we could code 'em
Share price high, and rising fast.
Waited on a big IPO. We're gon'a be millionaires don't you know.
I guess it was all just too good to last.
Though we thought the web was the promised land. Coded our HTML by hand.
But when we put it live, it didn't work in IE5.
We started to feel like we were cursed. The dotcom bubble finally burst.
And then things went from bad to worse, we did the big rewrite.

And we were singing [Chorus]

Oh then there we were shouting out loud, "Move everything to the cloud.
And host it on virtual machines."
Elastic scale, to cope with load. Infrastructure built on code.
Though no-one's sure what DevOps really means.
Well, I sat and I watched the counters climb. Wishing I got paid overtime.
Then MongoDB failed. I guess it wasn't quite web scale.
We lost the whole availability zone. I couldn't get tech support on the phone.
That's the point that I wish I had known, they'd done a big rewrite.

We were singing [Chorus]

[slow, wistfull]

I did my time, paid my dues. I did my exit interviews. Turned around and walked away.

Tired of working for the man. I had a dream, I had a plan.

This time I'd do everything my way. Launched the perfect MVP.

Online, for all the world to see.

Working in a new style, fast and lean and agile.

I tracked all my feature requests. I wrote my code with unit tests.

Then one day, you know the rest. I did the big rewrite.

[Chorus]

[Pick up a bit]

We were singing

It's high time we reviewed are design

The code behind our system is just too Byzantine

We'll rewrite all the legacy and take it off-line

[slowing]

And It's goina compile first time.