

"Rudolph the Bright Red Photon",

words by Walter F. Smith, 11-5-05

(sung to "Rudolph the Red-nosed Reindeer", tune by Johnny Marks, words by Robert May)

You know Ampere, and Kirchoff, and Bunsen, and Maxwell,
Fraunhofer, Faraday, they knew their facts well!
But do you recall... the most famous discovery of all?

Rudolph the bright red photon / Had momentum $h\text{-bar } k$,
But if you ever saw him, / He'd collapse his state they say.
Young's two-slit interference / Used to make him scratch his head --
"Should I take this or that path? / Maybe I'll take both instead!"

To avoid catastrophe, / Max Planck had to say, "Ho Ho Ho --
Quantize energy of light -- h times ν will work just right!"
Later, in 1913, / Niels Bohr shouted out with glee,
"Photons can cause transitions -- / Give that Nobel Prize to me!"

"STATIC EQUILIBRIUM" (sung to "Winter Wonderland")

by Alvin Lee, Wakefield High School, Arlington VA, 1983

All my moments have cancelled, sum of forces is equal,
I'm fully inert, and doing no work, here in sta-tic e-qui-lib-ri-um.
Every push meets another, every pull has a counter,
the state I allude is true lassitude, here in sta-tic e-qui-lib-ri-um.

(Bridge:)

All my forces balance out exactly,
you can even put me to the test.
Push me out in any ole direction,
And you'll find I'll no longer be at rest.

Can't you see that I'm happy? Sitting here, calm and mellow?
Don't want to go home, So leave me alone,
here in sta-tic e-qui-lib-ri-um.

"OH ENERGY" (sung to "Oh Christmas Tree")

by Will Wicker, Wakefield High School, Arlington VA, 1986

Oh, en-er-gy, oh, en-er-gy, conserving you's not up to me.
Some people say, "Don't waste a Watt!!" They say it's true, I say it's not!
Oh, en-er-gy, oh, en-er-gy, conserving you's not up to me.

Oh, en-er-gy, oh, en-er-gy, con-ser-va-tion, that's the key.
What's the big deal, what's the fuss? Electric bills are fooling us.
Oh, en-er-gy, oh, en-er-gy, con-ser-va-tion, that's the key.

Oh, en-er-gy, oh, en-er-gy, you are conserved in spite of me.
Your conservation is the law, you're not used up, just changed, that's all.
Oh, en-er-gy, oh, en-er-gy, you are conserved in spite of me.

“IT CAME UPON A DEMO DAY”
(Sung to “It Came Upon a Midnight Clear”)
by Marian McKenzie, 12-15-03

It came upon a demo day
In Denmark long ago
With Oersted bending near the bench
To make the current flow.
The students watch the needle move
And, awed, they vent their cries –
“Gosh, wow, Professor!” they exclaim.
“Good Golly!” He replies.

Still at the modern demo bench
What Oersted found, we find -
Electric and magnetic fields
Delightfully entwined.
We see, wherever we may be
What Oersted’s students saw
And hail the glad discovery
That gave us Ampere’s law

And ye, beneath work’s crushing load
Whose forms are bending low
Who labor through each problem set
In painful steps and slow
Take heart, for Oersted’s golden hour
Can move us, even now
And makes us echo, in joyous tones
That long ago “Gosh Wow!”

“I HAVE A TINY QUBIT”
(Sung to “I Have a Little Dredel”)
by Carlton Caves, Kavli Institute for
Theoretical Physics, Univ. Calif. Santa Barbara

I have a tiny qubit.
I made it from a spin.
And when my qubit’s ready,
I’ll get a lot of them.

Chorus:
Oh, qubits, qubits, qubits!
I think they’re really cute.
And when they’re all quite perfect,
My qubits will compute. (repeat chorus)

“JAMES CLERK MAXWELL”
(sung to “Good King Wenceslas”)
words by The Faculty of the
University of Northern Arizona

James Clerk Maxwell did look out
On the fields of Faraday.
Where the charge lay round about
Scattered this and that-a-way.
Twisted boundaries in and out
Raised to strange potentials.
If solutions could be found,
It would be providential.

Then came four equations out
With assorted Theorems,
Complex singularities,
Maxwell didn’t fear ‘em.
Tamed the demons, wrote a book,
Set right former errors.
Gave to theorists pure delight,
And to students terrors!

PHOTOCELLS (sung to "Jingle Bells")
author unknown

Dashing through space-time
At the speed of light
Through vector fields we go
With our colors bright.
Keeping constant speed
In every frame is right.
Oh what fun it is to be a photon in the night.

Chorus: Decibels, photocells,
Now I’m going to lase.
Oh what fun it is to be a boson in the rays. Hey!
Grad of dels, colored gels,
Diffraction grating blaze.
Oh what fun it is to be a boson in the rays.

Cut across the lab
By a mirror steered
Through the slits we go
Nothing do we fear.
Back again we come
To the screen we’ve veered,
Oh what fun it is to be a photon interfered.
Chorus...