Welcome to the LDSHE Wednesday Webinar Series!

April 29 - 11 a.m. EST	Creators in a Consumptive World
April 29 - 6 p.m. EST	Seek Scientific Knowledge by Study and also by Faith
May 6 - 11 a.m. EST	Taking Charge of Your Own Education and Loving It!
May 6 - 6 p.m. EST	Dyslexia, Dysgraphia, and Other Reading Struggles

LDSHE
Latter-day Saint Home Educators

Our mission is to support, strengthen, and inspire Latter-day Saint families in home-centered education.

LDSHE.org facebook.com/LDSHE instagram.com/ldshe LDSHEpodcast.org

Seek Scientific Learning by Study and also by Faith

David Handy

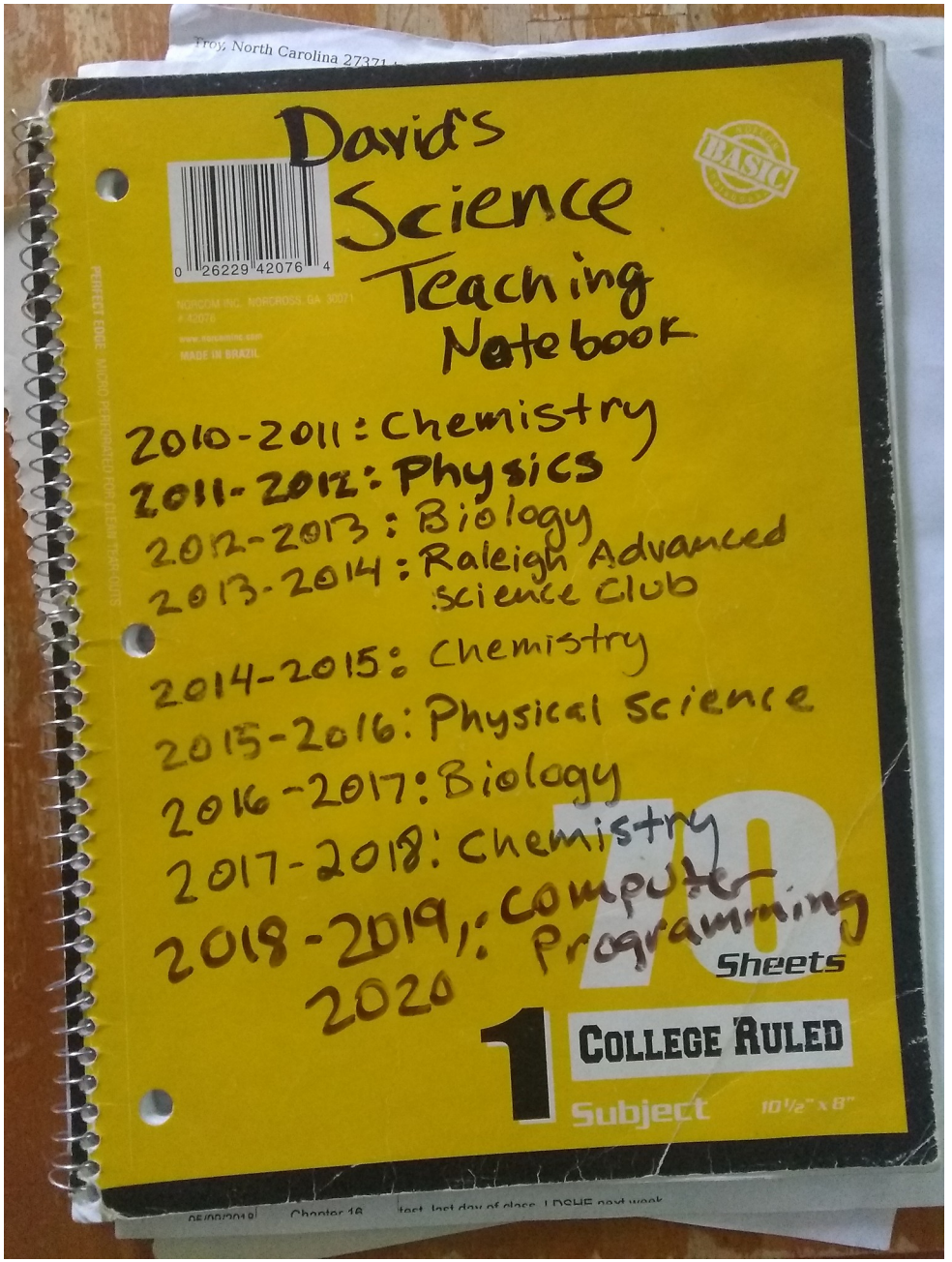
LDSHE April 2020 webinar

And as all have not faith, seek ye diligently and teach one another words of wisdom; yea, seek ye out of the best books words of wisdom; seek learning, even by study and also by faith. Doctrine and Covenants 88:118

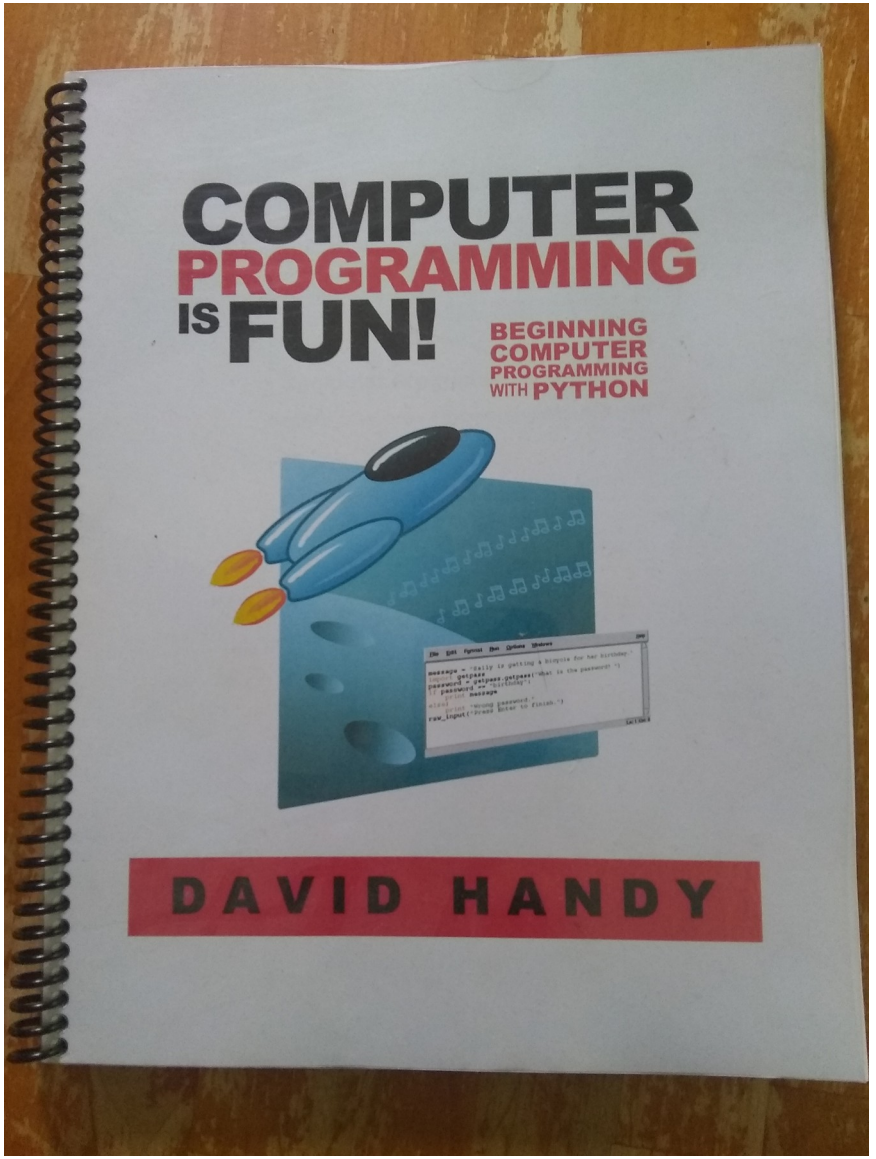
Who am I?

- Homeschooling Dad
- Science and Technology Nerd
- Follower of Christ

10 Years of High School Science



I teach computer programming to anyone who doesn't run away



I can’t stop doing math ...

Motion of mass through force field with damping force proportional to velocity

$$m\frac{d^2\mathbf{x}}{dt^2} + R\frac{d\mathbf{x}}{dt} = \mathbf{F}(t)$$

where R is the resistance and $\mathbf{F}(t)$ is the force due to the "field" at time t.

I went to a web site describing Variation of Parameters at Paul's Online Math Notes (highly recommended) to refresh myself on differential equation.

First I had to get the equation into the form:

$$y'' + q(t)y' + r(t)y = g(t)$$

I did this by dividing both sides by m.

$$\frac{d^2\mathbf{x}}{dt^2} + \frac{R}{m}\frac{d\mathbf{x}}{dt} = \frac{1}{m}\mathbf{F}(t)$$

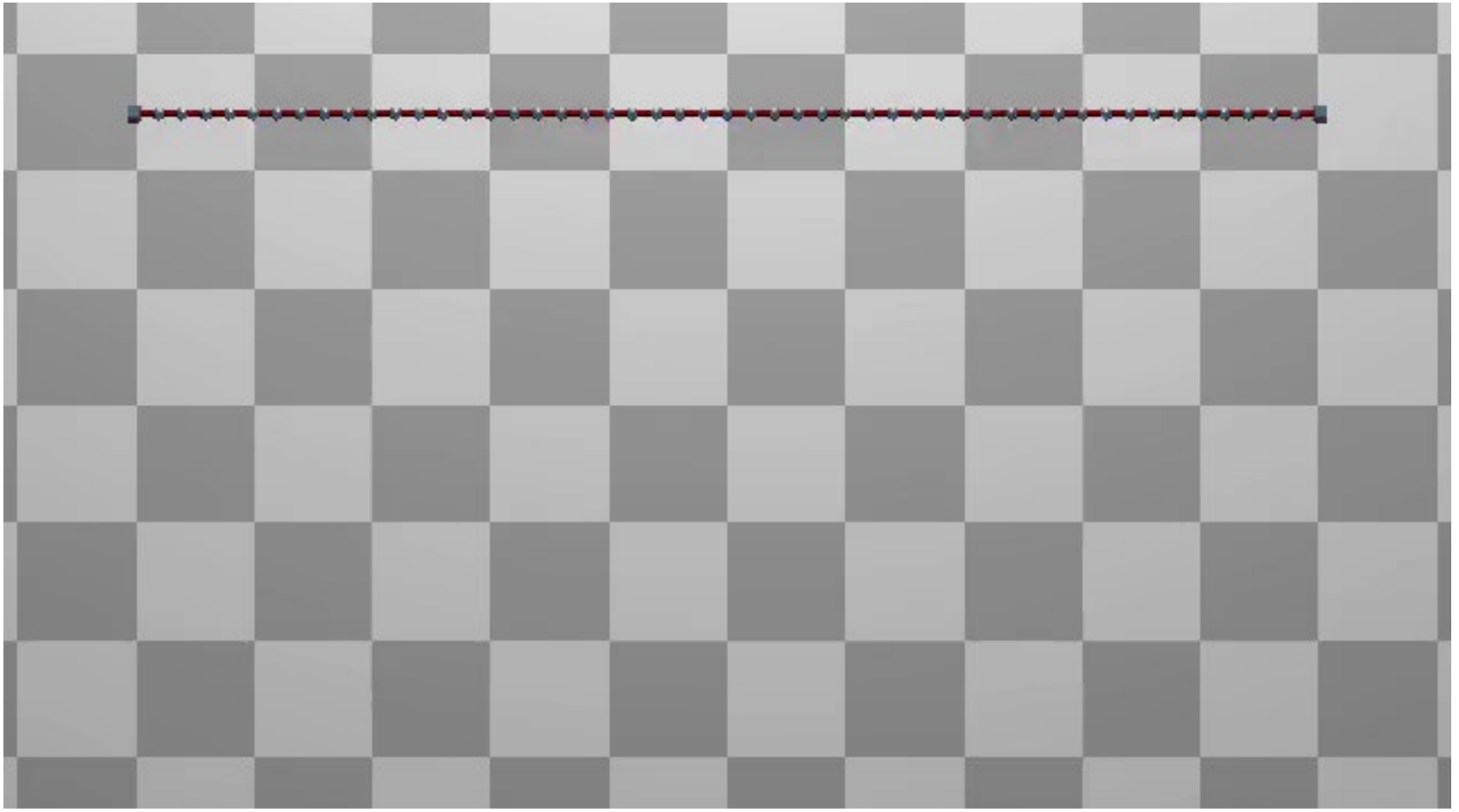
Given the initial approximation of $\mathbf{F}(t) = \mathbf{F_0}$, I got these equations for position and velocity:

$$\mathbf{x}(t) = \mathbf{x_0} + \frac{m}{R}\mathbf{v_0} + (\frac{\mathbf{F_0}m}{R^2} - \frac{m}{R}\mathbf{v_0})e^{-\frac{R}{m}t} + \frac{\mathbf{F_0}}{R}t - \frac{\mathbf{F_0}m}{R^2}$$

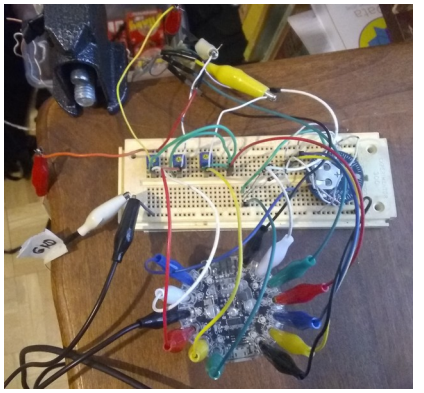
$$\mathbf{v}(t) = -\frac{R}{m}(\frac{\mathbf{F_0}m}{R^2} - \frac{m}{R}\mathbf{v_0})e^{-\frac{R}{m}t} + \frac{\mathbf{F_0}}{R}$$

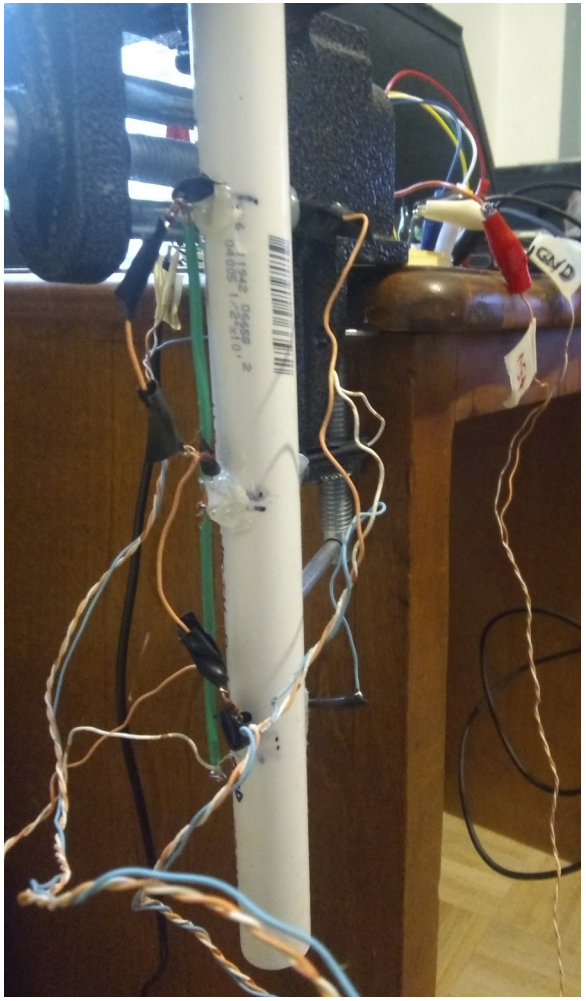
Source code: https://bitbucket.org/dhandy2013/physical-science/src/master/

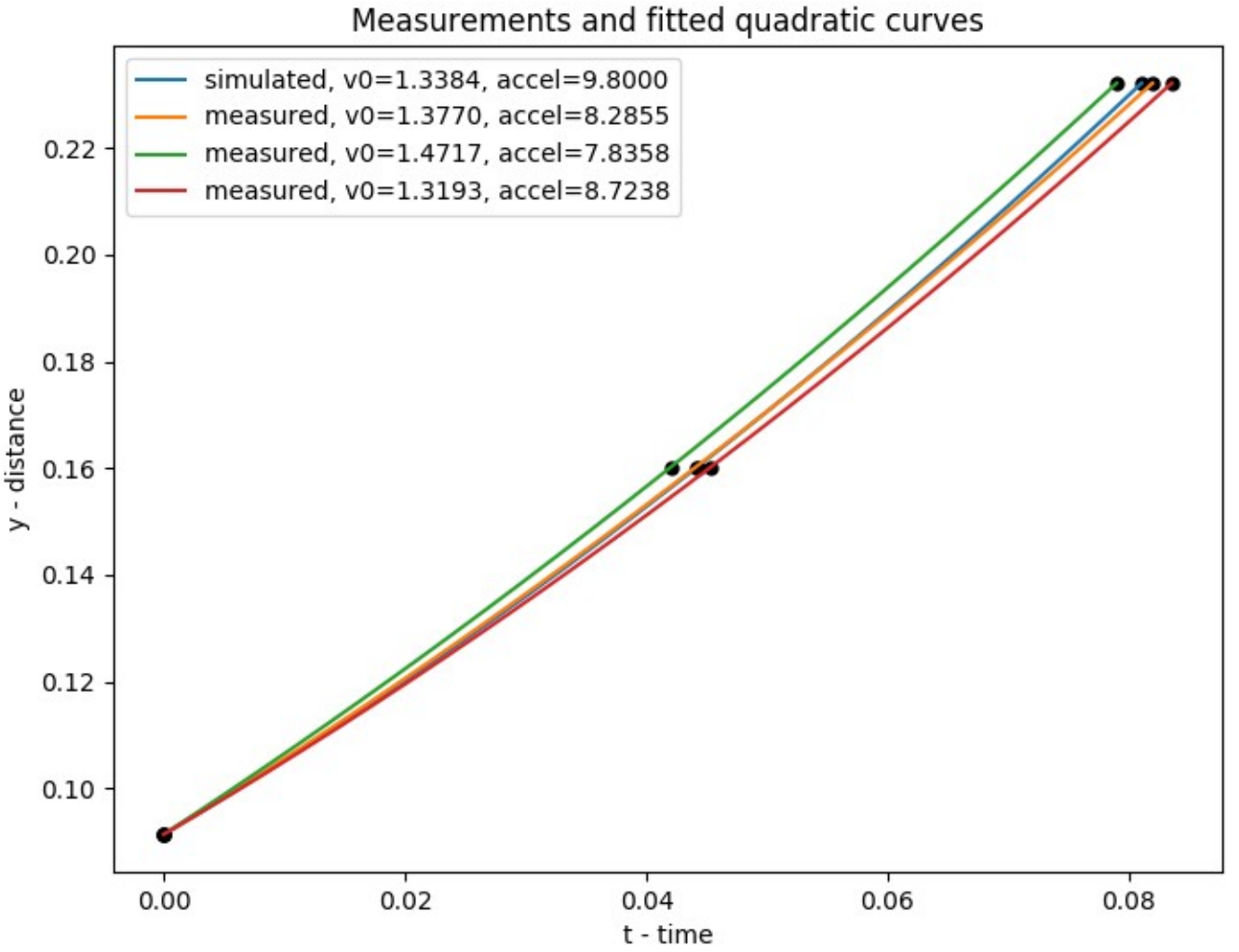
… or creating simulations



or doing experiments!







What I will talk about

(not strictly in this order!)

- What is science?
- Motivation for the reluctant scientific learner
- The truth about God and science
- Success stories of young scientists
- Everyday use of science by non-scientists
- The amazing miracle of life and creation
- Time permitting, some career advice

What is science?

- ~~Guys in white lab coats looking in microscopes~~
- ~~Limited to universities and government institutions~~
- ~~Advanced college degree required~~
- ~~Only done by really smart people~~
- None of the above!

My Definition of Science

The Disciplined Pursuit of Truth

- Controlled experiments
- Record keeping
- Peer review
- Reproducible results
- Logical analysis, using mathematics

Science is for Followers of Christ

Science is the pursuit of truth. Jesus knows everything. Let’s become more like our Savior through science.

Everyone is a Scientist in Real Life

All Humans are Scientists

“We are all careful observers of our world. We all make mental notes of what we observe. We all use those notes to build conceptual models of how things work. And we all continually refine these models as needed. Without a doubt, this is science.”

Douglas Axe, “Undeniable: How Biology Confirms our Intuition that Life is Designed”, p. 96

Examples:

- Cooking
- Gardening
- Family history research

“But I’m not smart enough!”

Most people are held back not by their innate ability, but by their mindset. They think intelligence is fixed, but it isn’t. Your brain is like a muscle. The more you use it and struggle, the more it grows

https://www.khanacademy.org/youcanlearnanything

“But that sounds like hard work!”

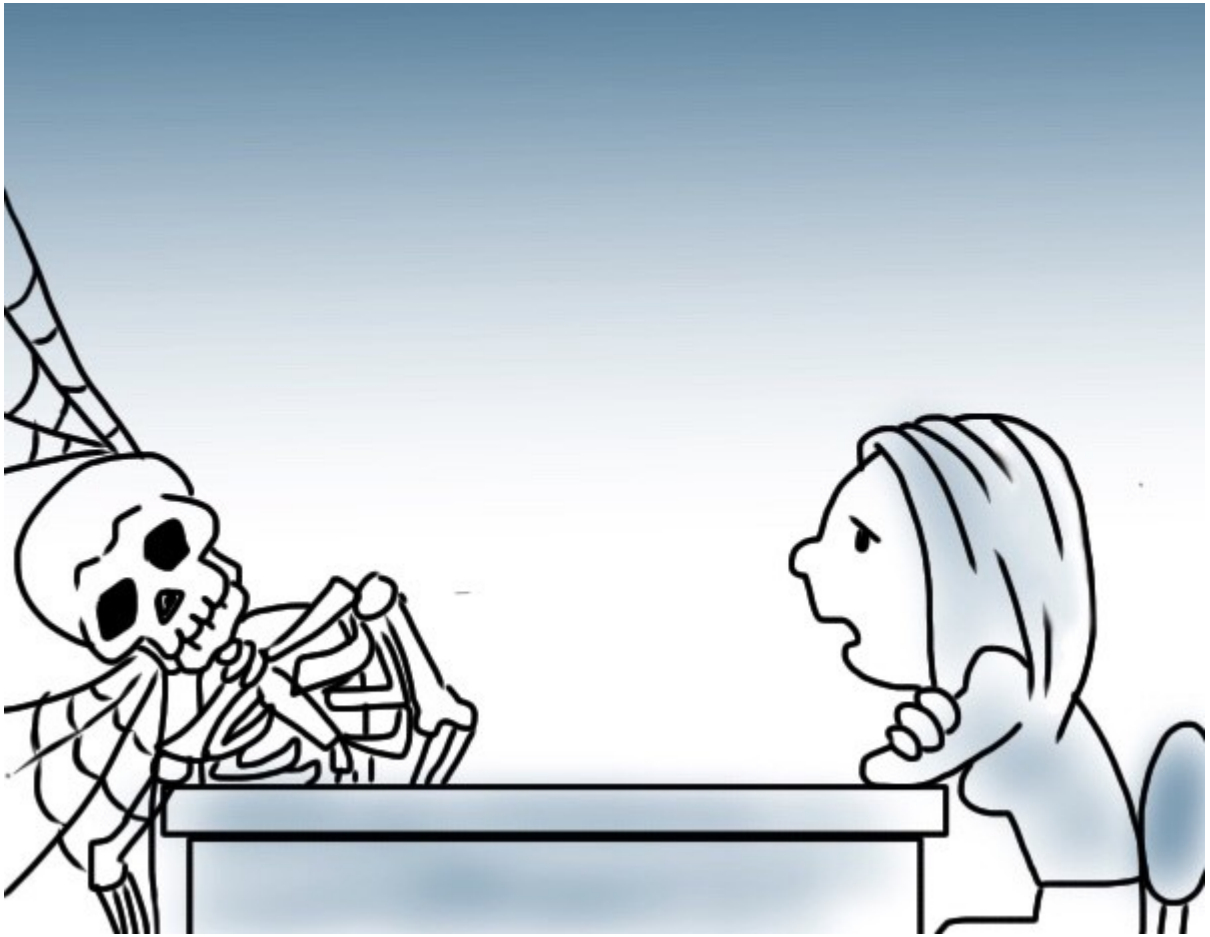
Quoted by Joy D. Jones,
Primary General President,
“An Especially Noble Calling”,
April 2020 General Conference

Pearl: “Is it hard to be a prophet? Are you, like, really busy?”

President Nelson: “Of course it’s hard. Everything to do with becoming more like the Savior is difficult…

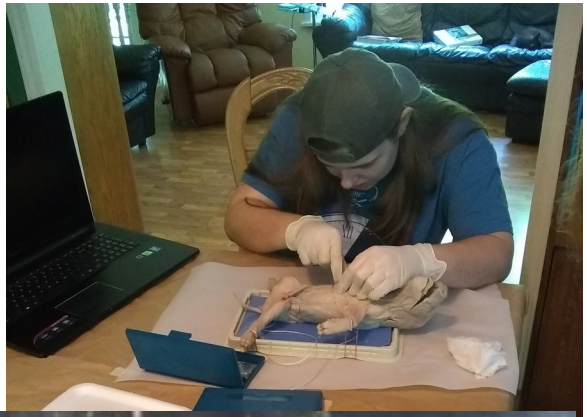
So the answer is yes, Pearl. It takes effort, a lot of hard work, a lot of study, and there’s never an end. That’s good! That’s good, because we’re always progressing. Even in the next life we’re making progress.”

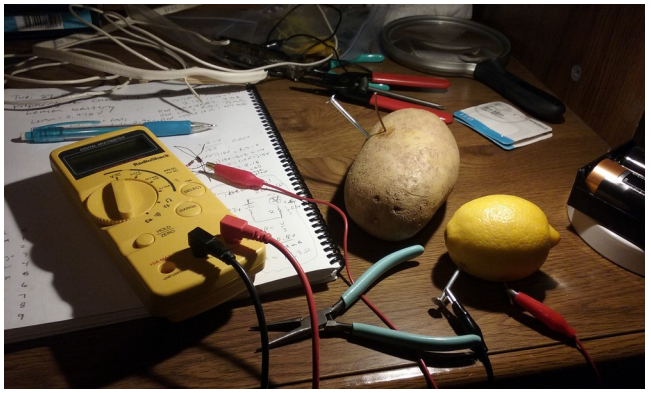
“But science is boring!”



https://upload.wikimedia.org/wikipedia/commons/0/02/Bored_to_death.jpg

Homeschool science is as fun as you make it!





Be careful!

- There is **humble science**…
- … and there is **toxic science**.

Toxic Science Teaches:

- There is no intelligent design in nature
- There is no purpose or plan in nature
- There cannot be any scientific evidence for God

And in nothing doth man offend God, or against none is his wrath kindled, save those who confess not his hand in ***all things****, and obey not his commandments.* Doctrine and Covenants 59:21

But, behold, I have ***all things*** *as a testimony that these things are true; and ye also have all things as a testimony unto you that they are true;* Alma 30:41

Humble Science

- Accepts truth from any source
- Follows the data wherever it leads
- Realizes its own limitations
- Willing to change own opinion when more data is available

For the natural man is an enemy to God, and has been from the fall of Adam, and will be, forever and ever, unless he yields to the enticings of the Holy Spirit, and putteth off the natural man and becometh a saint through the atonement of Christ the Lord, and becometh as a child, submissive, meek, humble, patient, full of love, ***willing to submit*** *to all things which the Lord seeth fit to inflict upon him, even as a child doth submit to his father.* Mosiah 3:19

Kim Woo-Ju

- Kim Woo-Ju, Professor of Infectious Disease, Korea University College of Medicine, talking about Korea's exemplary efforts fighting COVID-19:
- https://www.youtube.com/watch?v=gAk7aX5hksU&feature=youtu.be

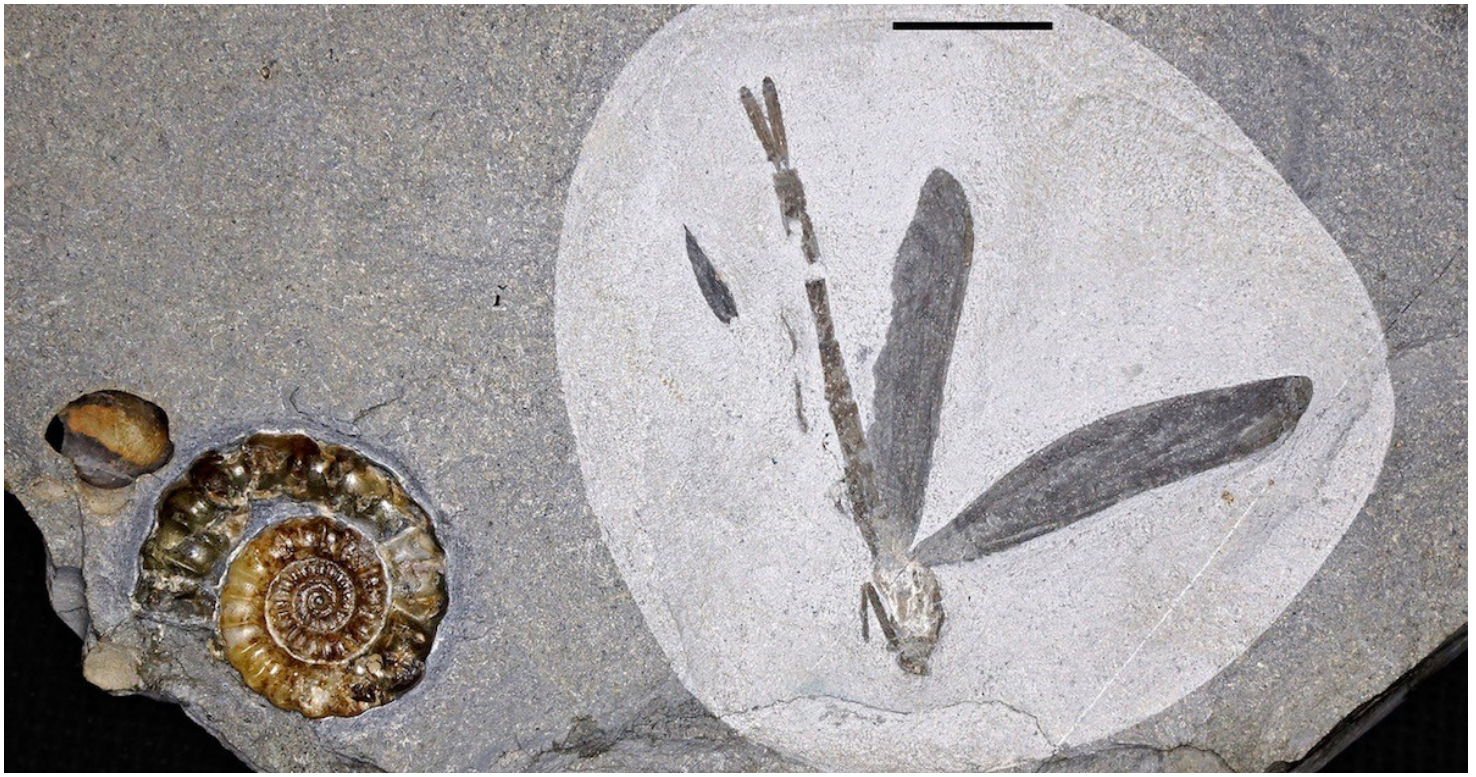
"You have to be humble. That is science. If you aren't humble you will lose."

Dr. Kim Woo-Ju, cont.

Amen!

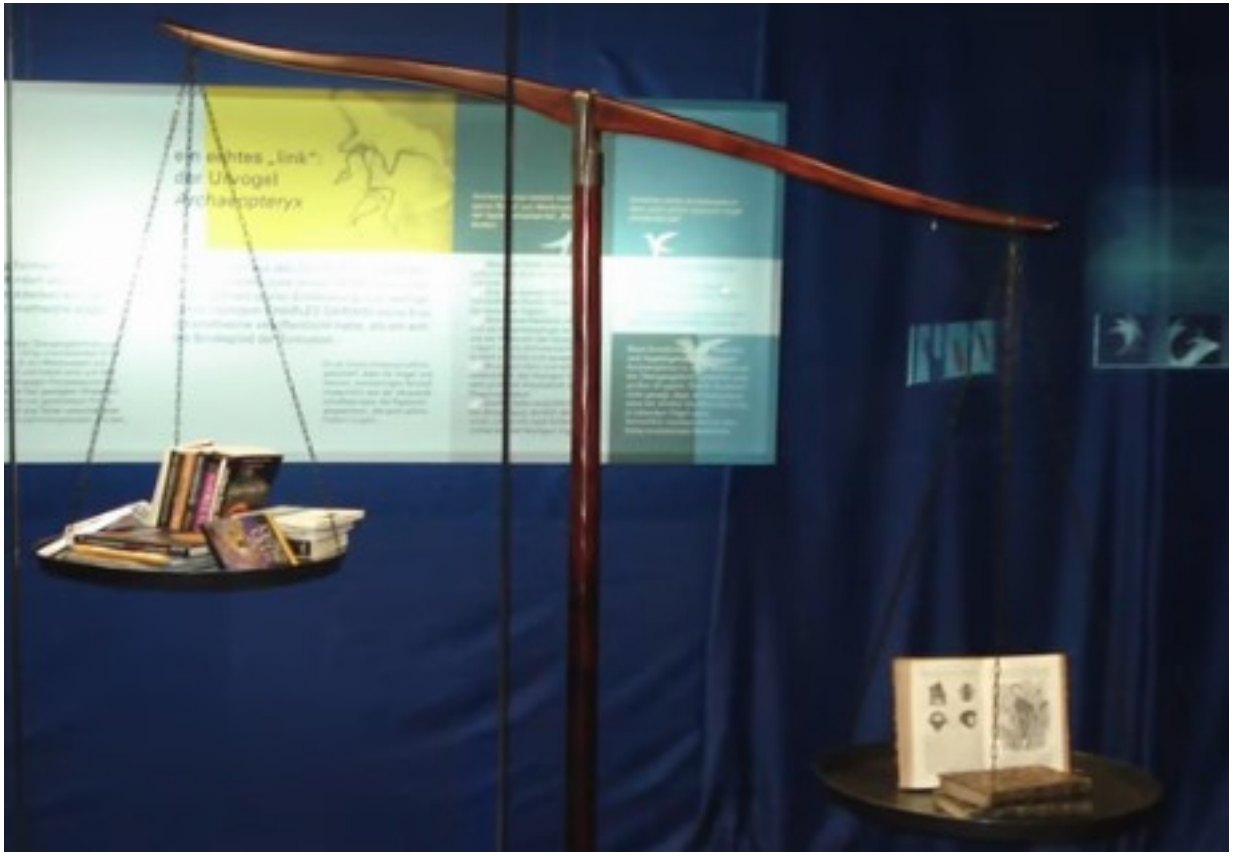
Günter Bechly

- Günter Bechly - German paleo-entomologist who specializes in the fossil history and systematics of insects (esp. dragonflies)



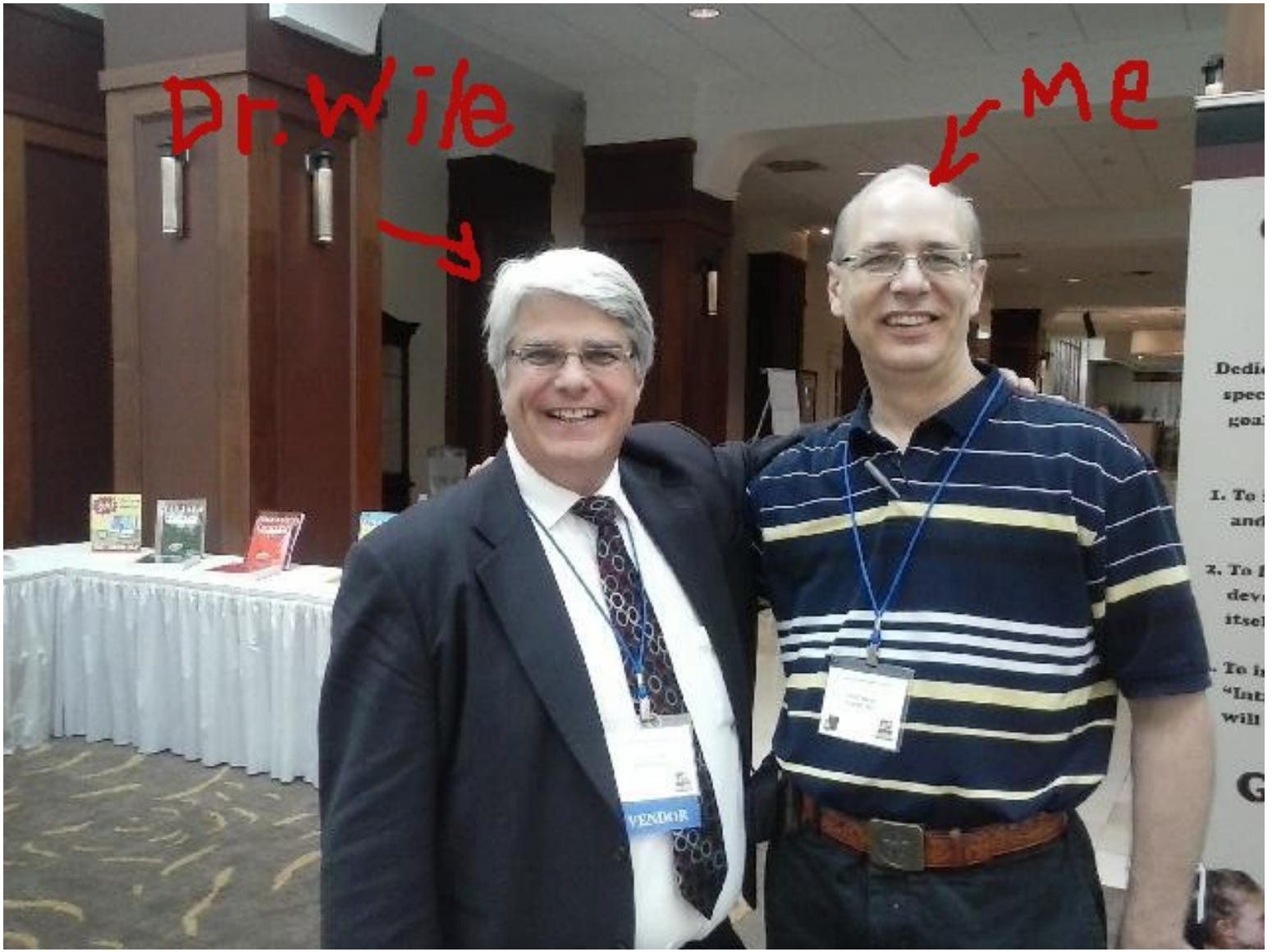
Günter’s Journey

https://www.youtube.com/watch?v=fqiXgtDdEwM



In 2009, he dared to actually read “Darwin’s Black Box” by Michael Behe and found it to be reasonable, causing him to defect from Darwinism.

Jay Wile



Dr. Wile and I at the 2015 LDSHE conference in Williamsburg

Dr. Wile, cont

Author of numerous homeschool science textbooks, with titles like “Exploring Creation with Biology” and “Discovering Design with Chemistry”

https://bereanbuilders.com/ecomm/

As a scientist, it is hard for me to fathom anyone who has scientific training and does not believe in God. The natural world, in my opinion, screams out His existence to anyone who examines it even in a cursory way. Indeed, it was science that brought me not only to a belief in God, but also to faith in Christianity. Dr. Jay Wile

https://blog.drwile.com/about-2/

Formula 1 and Software Engineering

My boss Alessandro helped train the Ferrari Formula 1 R&D team because they they wanted to learn agile development techniques (Scrum) from software developers.

During new model development, the average Formula 1 team ships ~1000 design changes per-week to a car.

Design Team and Engineering team work in close contact. The car is not “designed and then built”: It gets designed while building and built while designing.

Teenage scientist: Philo Farnsworth

Farnsworth continued his studies at Brigham Young University, where he matriculated in 1922 ... By 1926, he was able to raise the funds to continue his scientific work and move to San Francisco with his new wife, Elma "Pem" Gardner Farnsworth. The following year, he unveiled his all-electronic television prototype—the first of its kind—made possible by a video camera tube or "image dissector." **This was the same device that Farnsworth had sketched in his chemistry class as a teenager**.

https://www.biography.com/inventor/philo-t-farnsworth

Teenage scientist: Taylor Wilson

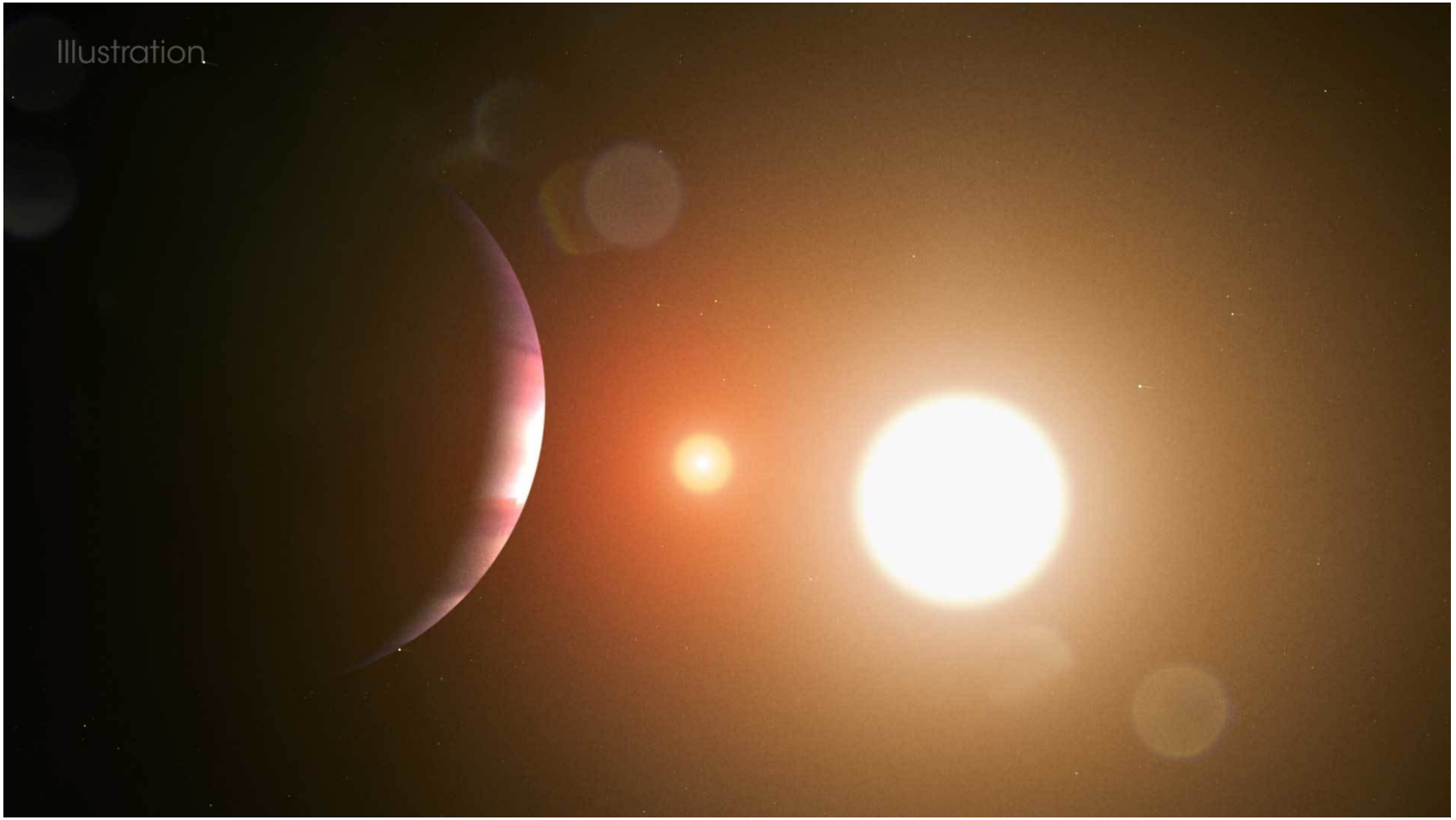
Taylor Wilson made a working fusion reactor at age 14.

"Where does it come from?" Kenneth and his wife, Tiffany, have asked themselves many times. Kenneth is a Coca-Cola bottler, a skier, an ex-football player. Tiffany is a yoga instructor. "Neither of us knows a dang thing about science," Kenneth says.

https://www.popsci.com/science/article/2012-02/boy-who-played-fusion/

Wolf Cukier

High School Student who discovered a new planet in January



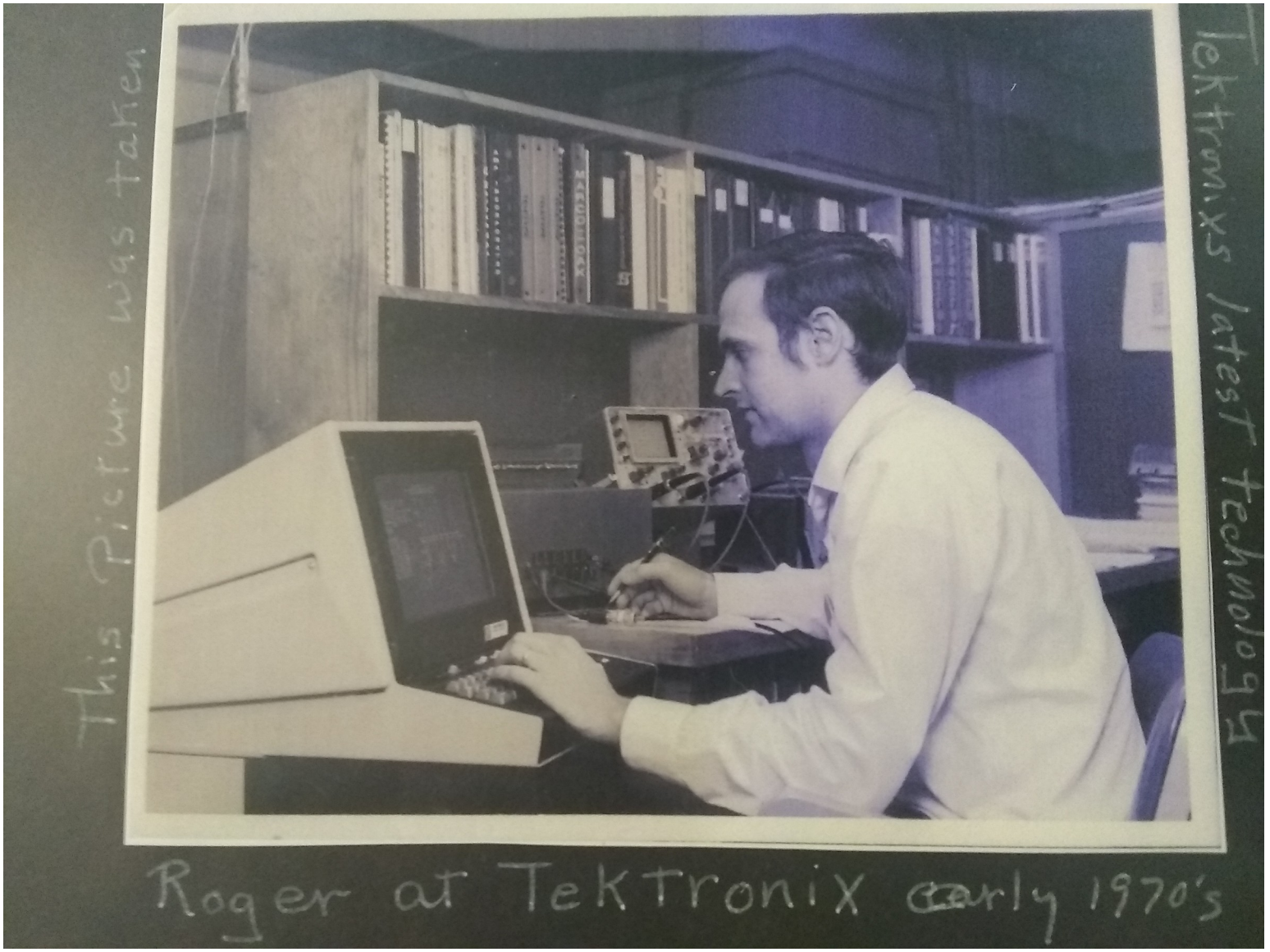
https://exoplanets.nasa.gov/news/1619/discovery-alert-high-school-student-finds-a-world-with-two-suns/

My Story

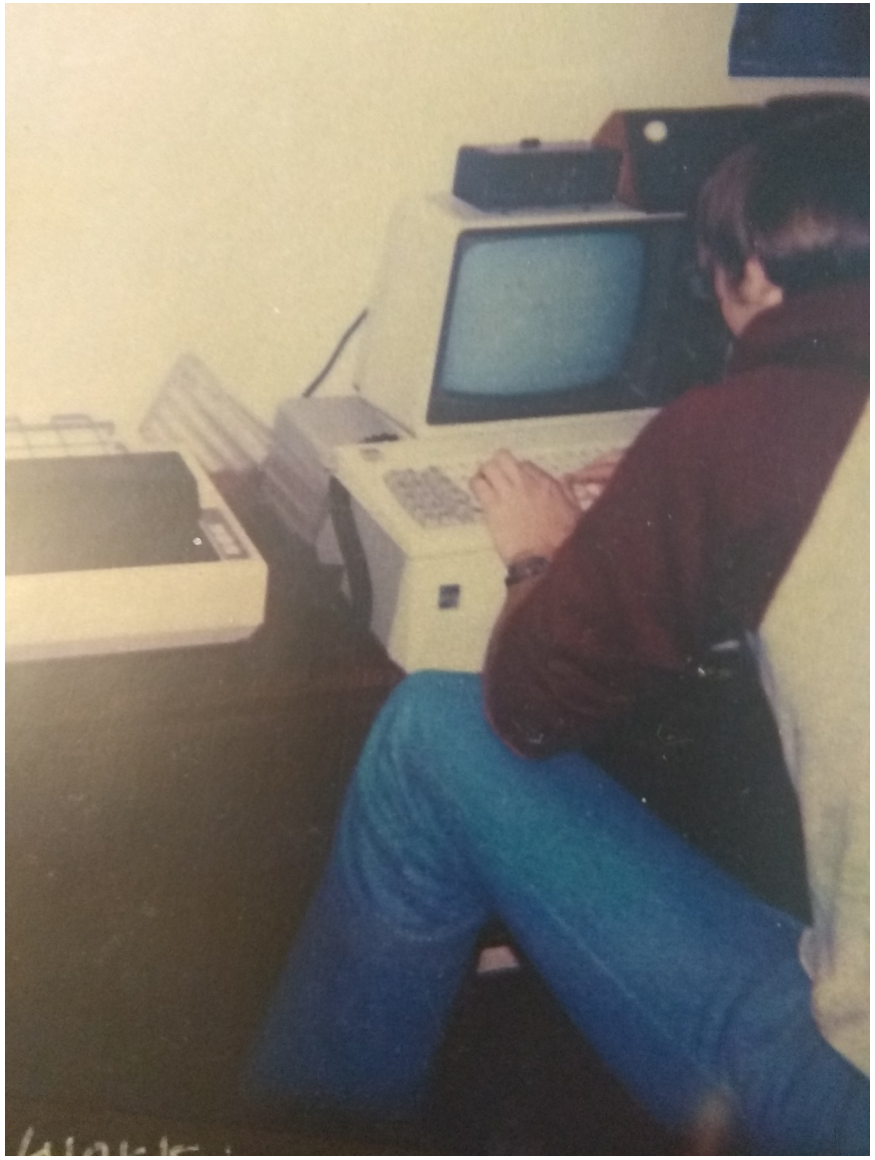
But seek ye first the kingdom of God, and his righteousness; and all these things shall be added unto you.

Matthew 6:33

Taught by goodly parents



“Home schooled” programmer



Age 12 (1979): Dad brought me to work with him after-hours to learn on the computers there

Age 16-17 (1982): Dad bought one of the very first IBM PCs ever made

Age 18 (1985): First programming job with Papa Aldo’s Pizza

Programming as a teenager really helped me later as an engineering student at BYU

Mentored by my seminary teacher

Hyper-Threading Technology Architecture and Microarchitecture

Deborah T. Marr, Desktop Products Group, Intel Corp.
Frank Binns, Desktop ProductsGroup, Intel Corp.
David L. Hill, Desktop Products Group, Intel Corp.
Glenn Hinton, Desktop Products Group, Intel Corp.
David A. Koufaty, Desktop Products Group, Intel Corp.
J. Alan Miller, Desktop Products Group, Intel Corp.
Michael Upton, CPU Architecture, Desktop Products Group, Intel Corp.

Index words: architecture, microarchitecture, Hyper-Threading Technology, simultaneous multi-threading, multiprocessor

ABSTRACT

Intel's Hyper-Threading Technology brings the concept

INTRODUCTION

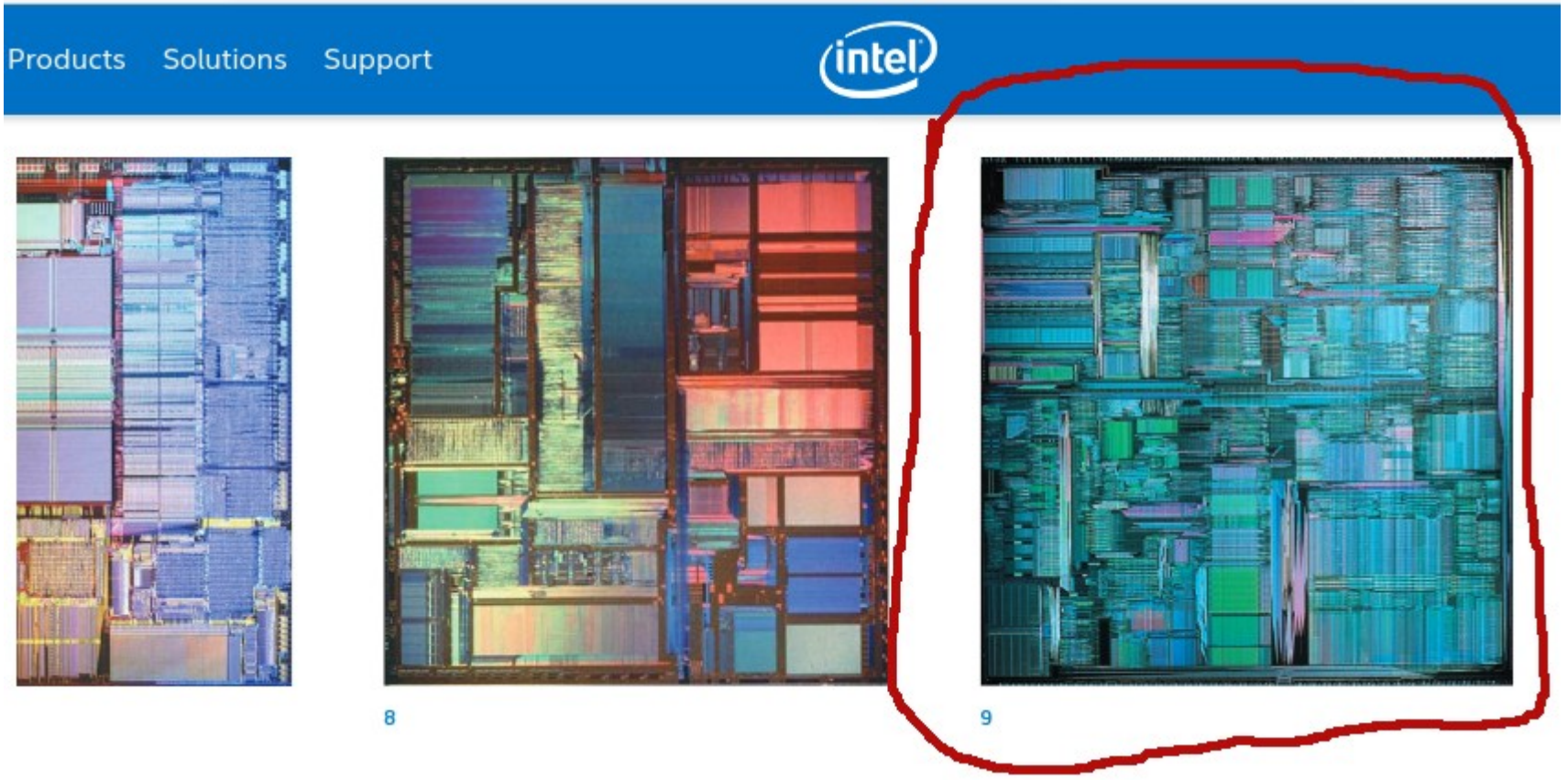
The amazing growth of the Internet and telecommunications is powered by ever-faster systems

https://www.intel.com/content/dam/www/public/us/en/documents/research/2002-vol06-iss-1-intel-technology-journal.pdf

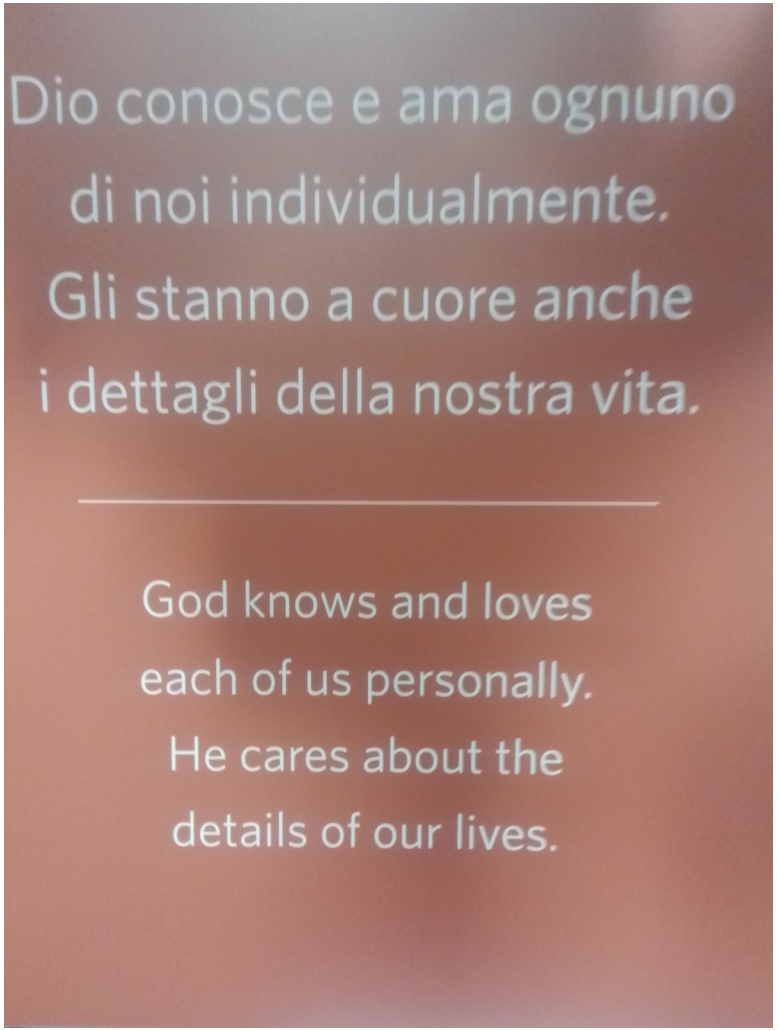
No math and science for two years while serving as a missionary...

… and my grades went **UP** when I came home and went back to school.

Privileged to work with the best engineers at Intel after graduating



Lesson Learned



God knows and loves each of us personally. He cares about the details of our lives.

The Privileged Planet

https://www.nasa.gov/multimedia/imagegallery/image_feature_1249.html

Apollo 8 ... entered lunar orbit on Christmas Eve, Dec. 24, 1968. That evening, the astronauts … held a live broadcast from lunar orbit, in which they showed pictures of the Earth and moon as seen from their spacecraft. Said Lovell, "The vast loneliness is awe-inspiring and it makes you realize just what you have back there on Earth." They ended the broadcast with the crew taking turns reading from the book of Genesis.

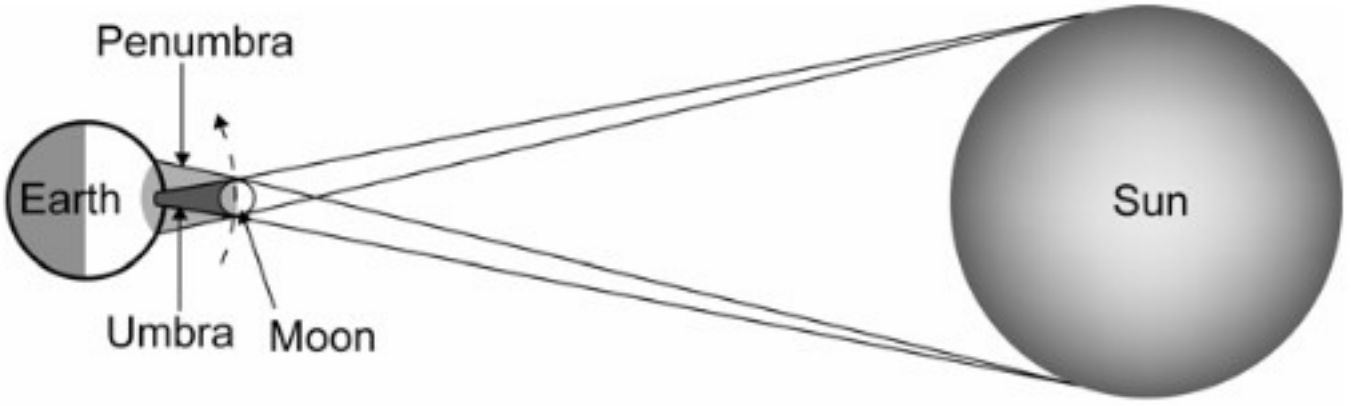
Fine Tuning

Astronomers now know that Earth is a rare, life-friendly “oasis in the big vastness of space”. Earth must orbit with just the right distance from the sun, axial tilt, shape of orbit, and planetary neighbors. Life depends on Earth having a moon of the right size at the right distance. The solar system as a whole must also reside in a narrow life-friendly band of space without our galaxy, the “galactic inhabitable zone.”

Even slight changes to the relative masses of fundamental particles… would have rendered the universe incapable of sustaining life.

Apollo 8 and Our Privileged Planet
https://www.discovery.org/a/20902/

No Coincidence



Free teacher's guide at: https://www.discovery.org/a/3330/

You and I may call these intersectings 'coincidence.' This word is understandable for mortals to use, but coincidence is not an appropriate word to describe the workings of an omniscient God. He does not do things by 'coincidence' but … by 'divine design.'"

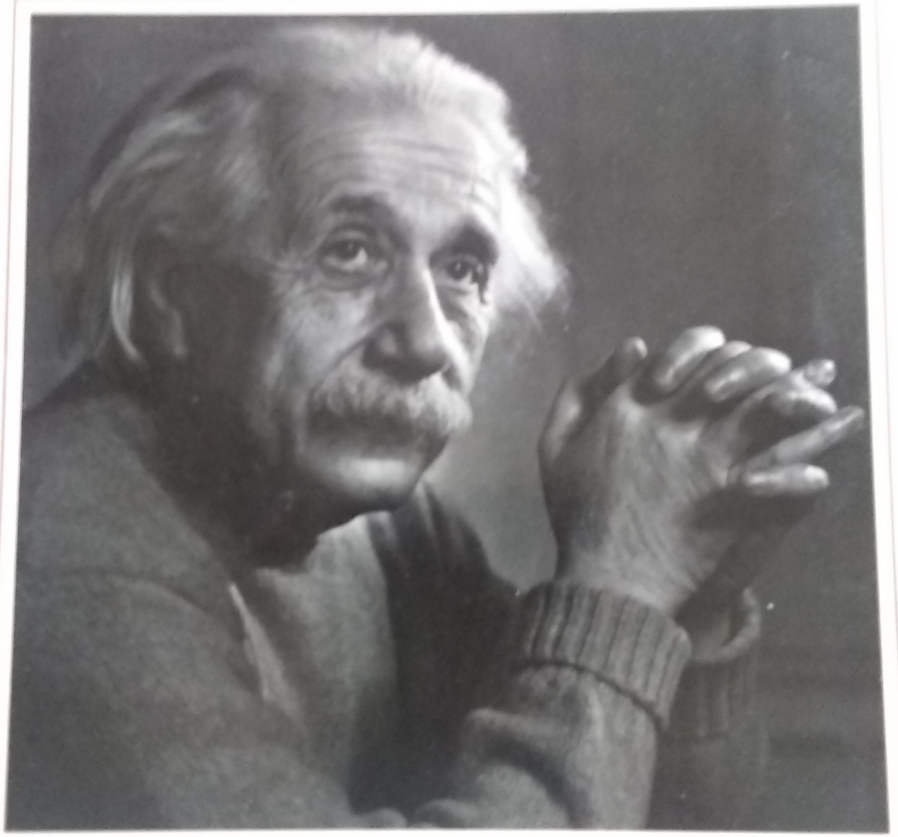
Elder Neal A. Maxwell, quoted by Elder Ronald A. Rasband in "By Divine Design", October 2017 General Conference.

Advice for Parents and Youth

- “**Seek ye first the kingdom of God**”
- **Learn to program**. In the era of self-driving cars, the best jobs will go to those who can code.
- **Read non-fiction**. (see reading list at link at end of presentation)
- Find **mentors** and learn from them
- Don’t wait to be taught things in school or on the job, **learn things on your own** proactively
- **Do things**! Create art. Write programs. Build things.
- **Keep moving forward**. “Life-long learning”

RELATIVITY

THE SPECIAL AND THE GENERAL THEORY



A CLEAR EXPLANATION
THAT ANYONE CAN UNDERSTAND

ALBERT EINSTEIN

Recommended reading list at:

https://handysoftware.com/ldshe/2020/