

TEACHING THE STANDARD MODEL IN SCHOOLS



Carleton
UNIVERSITY

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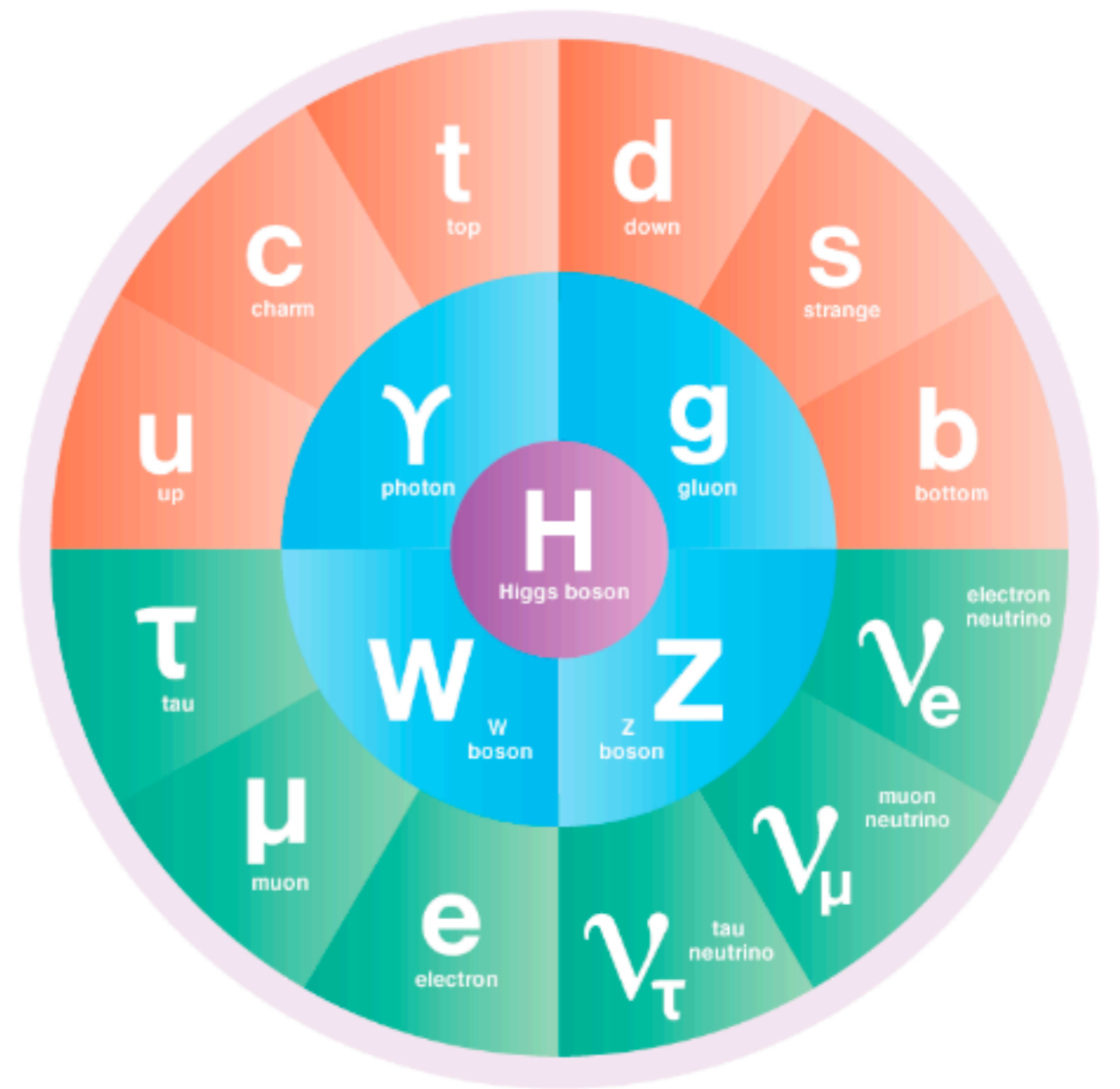
IPP 50th Anniversary Symposium — May 29, 2022

THE STANDARD MODEL

The Standard Model should also be taught in schools!

A great scientific achievement.

IPP is probably the best organization to lobby for inclusion in curricula.



● QUARKS ● LEPTONS ● BOSONS ● HIGGS BOSON

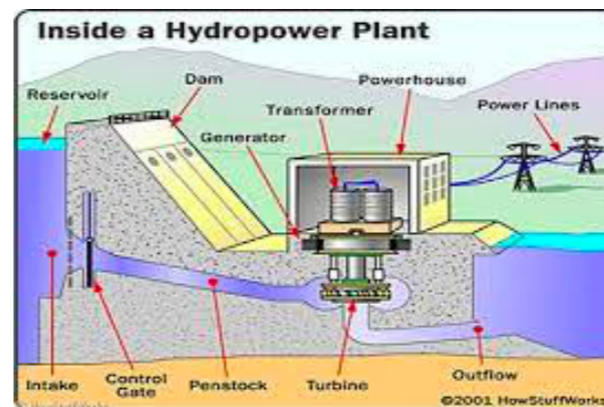
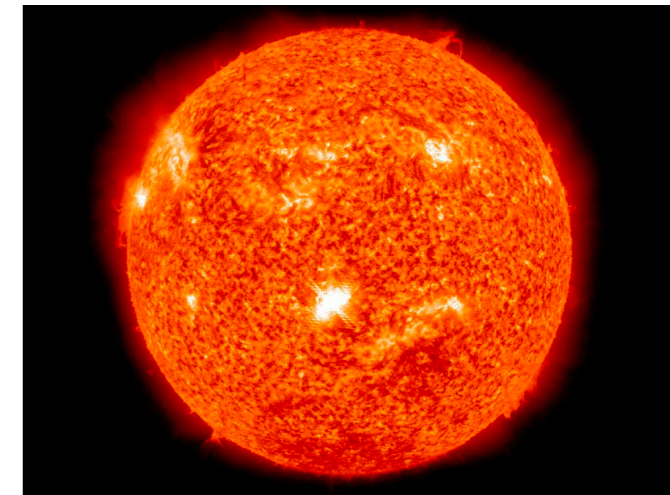
WHAT TO TEACH?

Everything is made of
u/d/e.

Four/five forces describe
all phenomena.

Examples of forces we
can see.

Open questions and
mysteries.



BRITISH COLUMBIA

Grade 8 Science:

- Protons and neutrons made of quarks held together by strong force.
- Electrons (and leptons) held at a distance by electromagnetism

Grade 10 Science:

- Formation of the universe and big bang theory
- Components of the universe over time.

ONTARIO + ALBERTA

Ontario

Grade 12 University physics:

- Identify and compare fundamental forces.
- Describe standard model of elementary particles.

Alberta

Grade 12 physics:

- Models of the structure of matter
- Colliders contributing to the development of the Standard Model.

OTHERS

Nova Scotia - suggested project topics in advanced grade 12 physics.

Quebec - nothing?

Manitoba - nothing?

ADVOCACY

Propose to create a group to study how to advocate to provinces to include the SM in primary and secondary education.

Possible strategy: choose one province first and concentrate efforts there.

Looking for volunteers to help with the study and potential advocacy in the future.

FEEDBACK

Do people have ideas for advocacy strategies?

Is there anyone with the audience with experience in shaping primary and secondary education?

Contact me (stolar@physics.carleton.ca) if you are interested in joining.

BACKUP

PERIODIC TABLE



TEACHING THE CHILDREN

Everything is made of elements.

Elements in the same column have similar properties.

Explaining atomic mass and atomic number.

Examples of some elements in life.

Periodic Table of the Elements

The periodic table is color-coded by groups: Alkali Metals (pink), Alkaline Earths (orange), Transition Metals (light blue), Basic Metals (yellow), Semi-Metals (green), Nonmetals (light green), Halogens (yellow-green), Noble Gases (light blue), Lanthanides (light purple), and Actinides (red). The legend at the bottom identifies these categories.



SOLAR SYSTEM

