

# Modern Physics and the Human Person

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image by DALL·E mini  
based on presentation title

**ASA 2022: What is a Human?**

***Flourishing as a Person***

*San Diego, CA – 31 July 2022, 4:30pm*



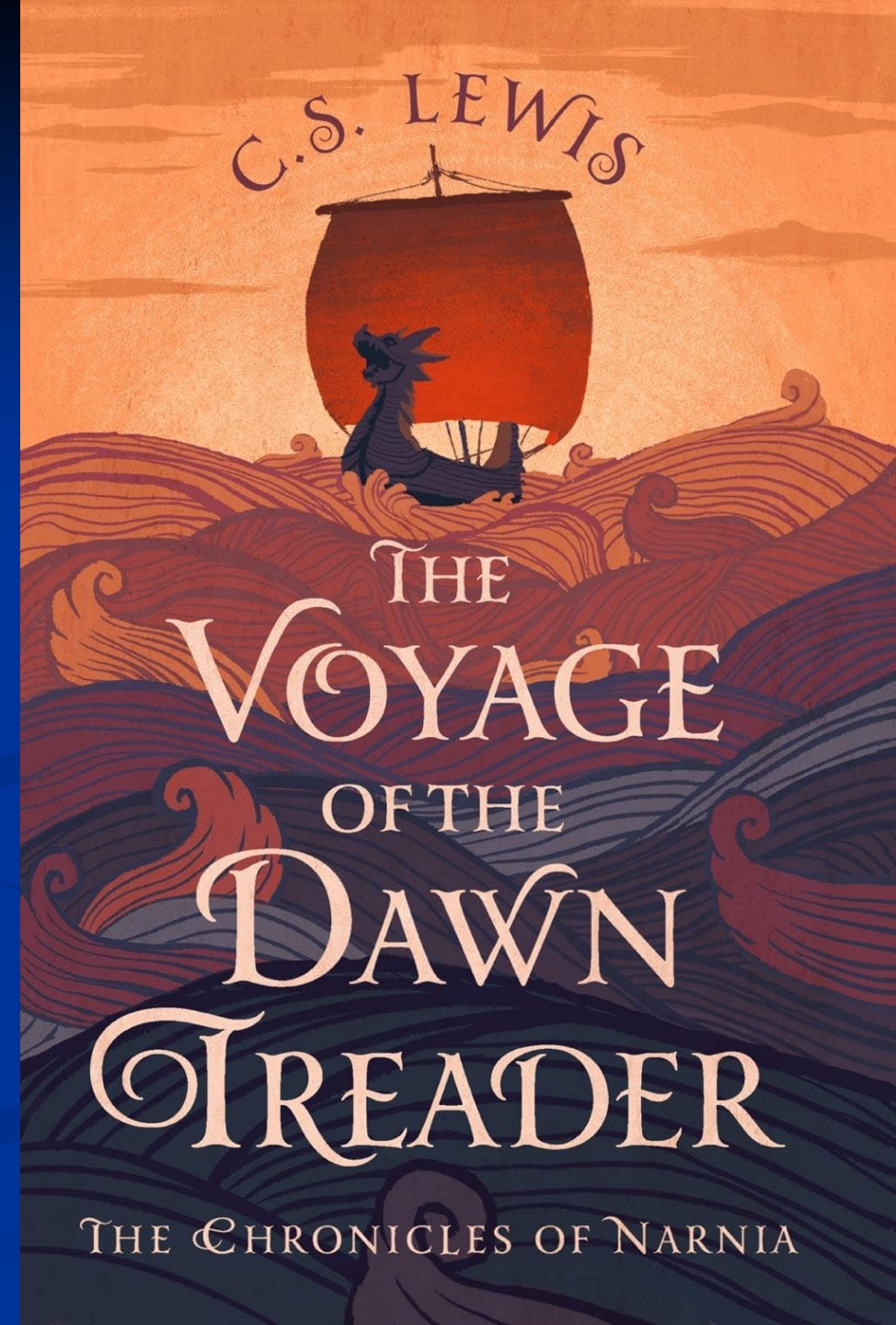
# Outline

- composition is more than physical
- anti-reductionism & emergence [skip]
- coherence across the multiple “aspects”
- indeterminism

# Ramandu, the Retired Star

Eustace: “In our world, a star is a huge ball of flaming gas.”

Ramandu: “Even in your world, my son, that is not what a star is but only what it is made of.”

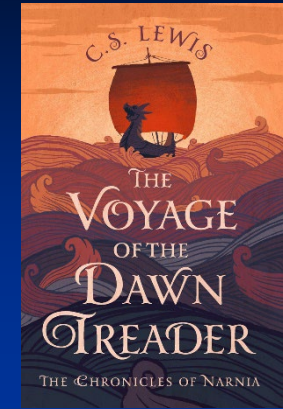


# So, What Are Stars?

- “huge balls of flaming gas”
- navigation aids
- objects of beauty and wonder
- sources of all atoms beyond helium
- centres of planetary systems
- sources of radiant energy for planets
- parts of galaxies



# What are We Made of ?

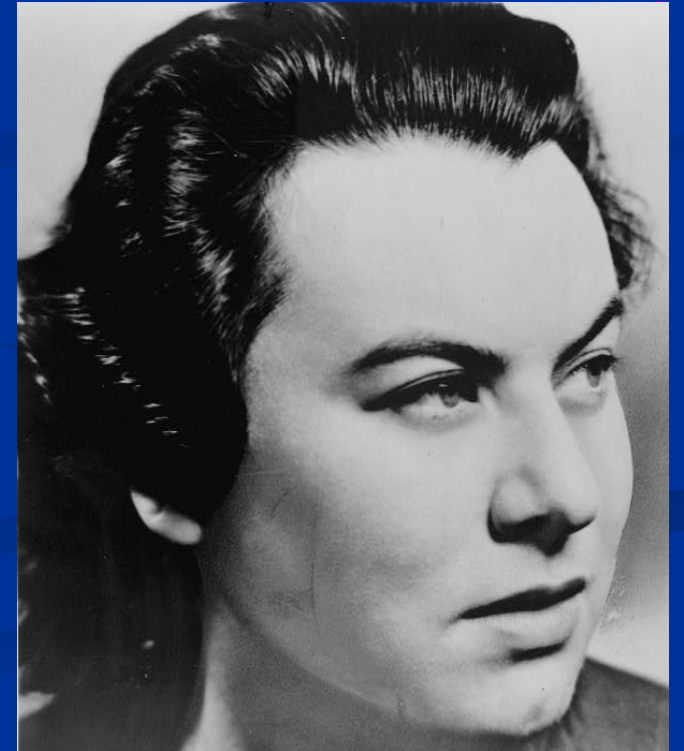


- Ramandu: “Even in your world, my son, that is not what a star is but only what it is made of.”
- Humans are made of...
  - protons, neutrons, electrons; atoms
  - molecules
  - cells, tissues, organs, systems
  - physical composition
  - chemical composition
  - biological composition
- But even this “physical” composition is not comprehensive.

# Muriel Rukeyser (1913-80)

“The universe is made of stories,  
not of atoms.”

from her poem *The Speed of Darkness*



# So What are We Made of ?

- atoms (etc.)
- stories
- relationships with others
- past experiences; future hopes
- dreams and desires; fears and beliefs; joys and concerns
- etc.
- physical, chemical, biological composition
- literary composition
- social composition
- temporal composition
- psychological composition

# Composition and Transcendance

- Don't equate the concept of composition to only physical composition.
- Remember the other aspects of our composition, ontology, being.
- We transcend the physical: we are more than our physical, chemical, and biological origins and structure.



# What is an Electron Made Of?

- Electrons are people too!

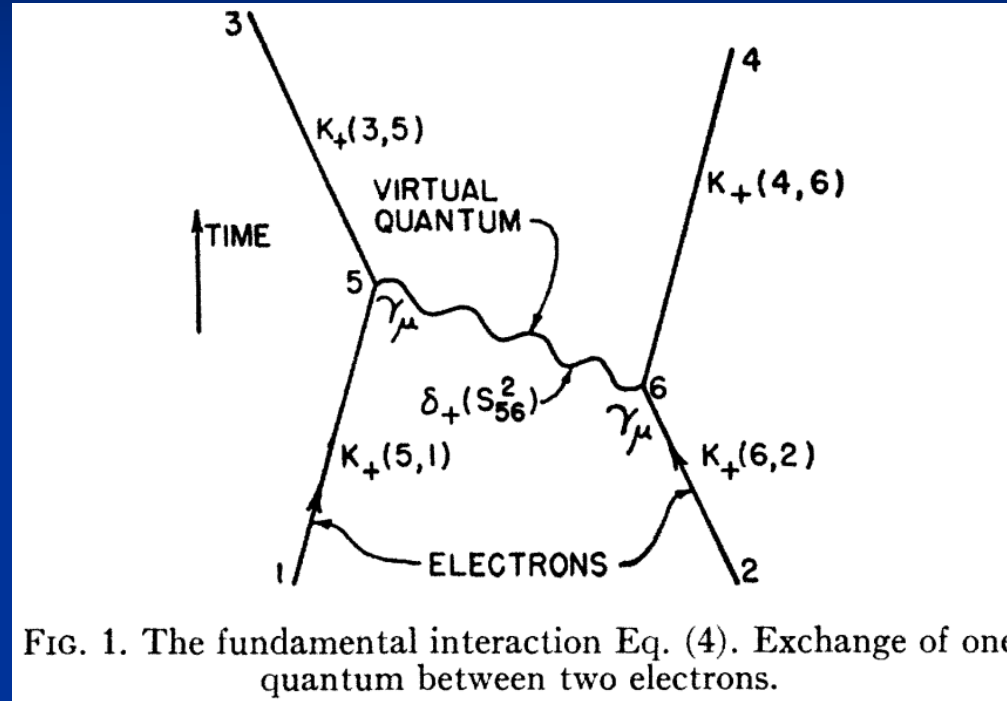
# What is an Electron Made Of?

- ~~Electrons are people too!~~
- Electrons, like people, are **composed of their relationships.**

# The First Feynman Diagram: QED

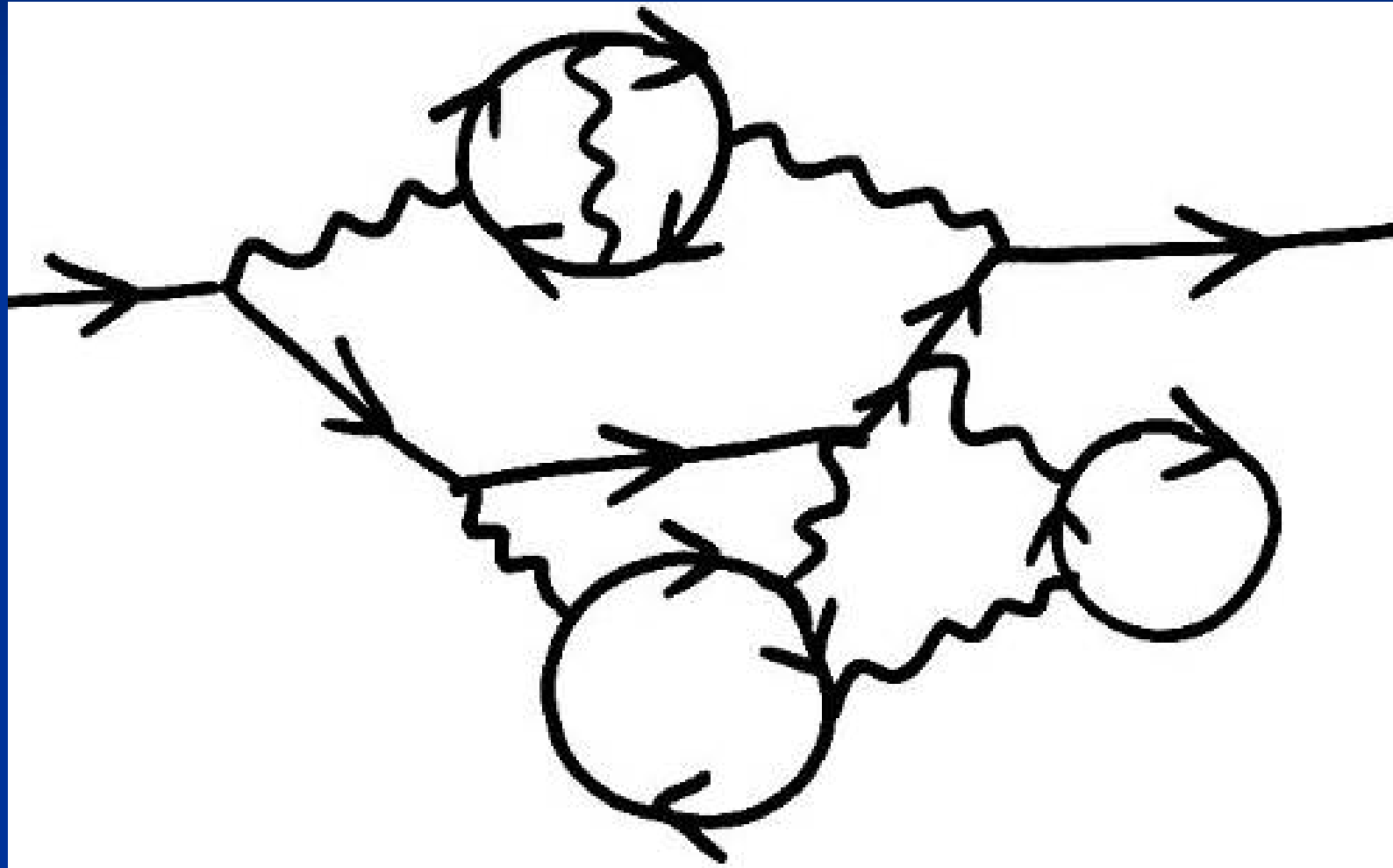


Richard Feynman  
aps.org

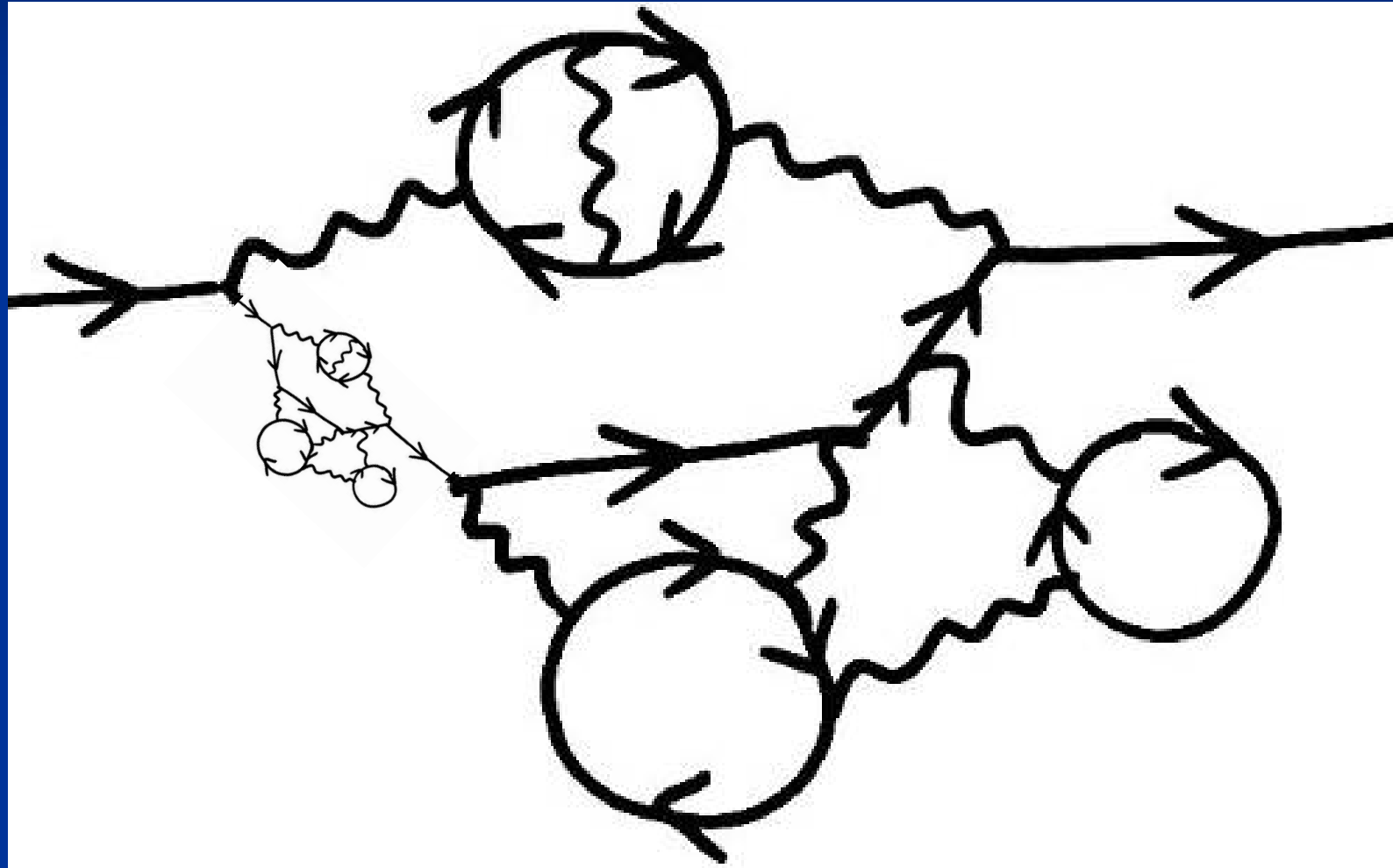


“Space-Time Approach to Quantum Electrodynamics,” *Physical Review* 76 (1949) 769.

# What is an Electron?



# What is an Electron?





# Coherence and Agency

## *Relation Between Mental & Physical Aspects*

- physical aspect: interaction between things (electrons, etc.)
- mental aspects: psychic-sensitive (feeling, emotion), analytical (making distinctions)
- Is the action of me raising my hand...
  - **bottom-up?** Electrons (etc.) move about and then give me the sense of having directed this action?
  - **top-down?** Electrons (etc.) begin to move above because a mental function (or spiritual entity) governs them?
  - **coherent!** I raise my hand. All aspects cohere.

# What is Indeterminism?

## General Idea

- determinism: The future of the world is fully determined by the present of the world.
- indeterminism: Determinism is false.

## Physical Examples

- Newton, Laplace
- Quantum events
- Chaotic systems

# Indeterminism & Humanity

- human will, choice, agency are real
  - and therefore indeterministic
- physical indeterminism coheres with general indeterminism
- quantum indeterminism & the biochemical scale

# Caveats

- some interpretations of quantum physics are deterministic
  - but require giving up locality & thus physical causality
- physical indeterminism does not negate divine determinism or divine providence
- physical indeterminism is random, but human will, choice, agency are not random

# Modern Physics & the Human Person

## *Summary & Suggestions*

- Ontology is relational: electrons, persons, everything
- Human actions are coherent across all aspects, instead of top-down or bottom-up causation
- The indeterminism of modern physics coheres with the indeterminism needed to be a human person.
- a resonance with the Trinity
- Creatures are integral and whole.
- Mystery remains.