

# Sophistication about Symmetries @ 2019 Neil Dewar

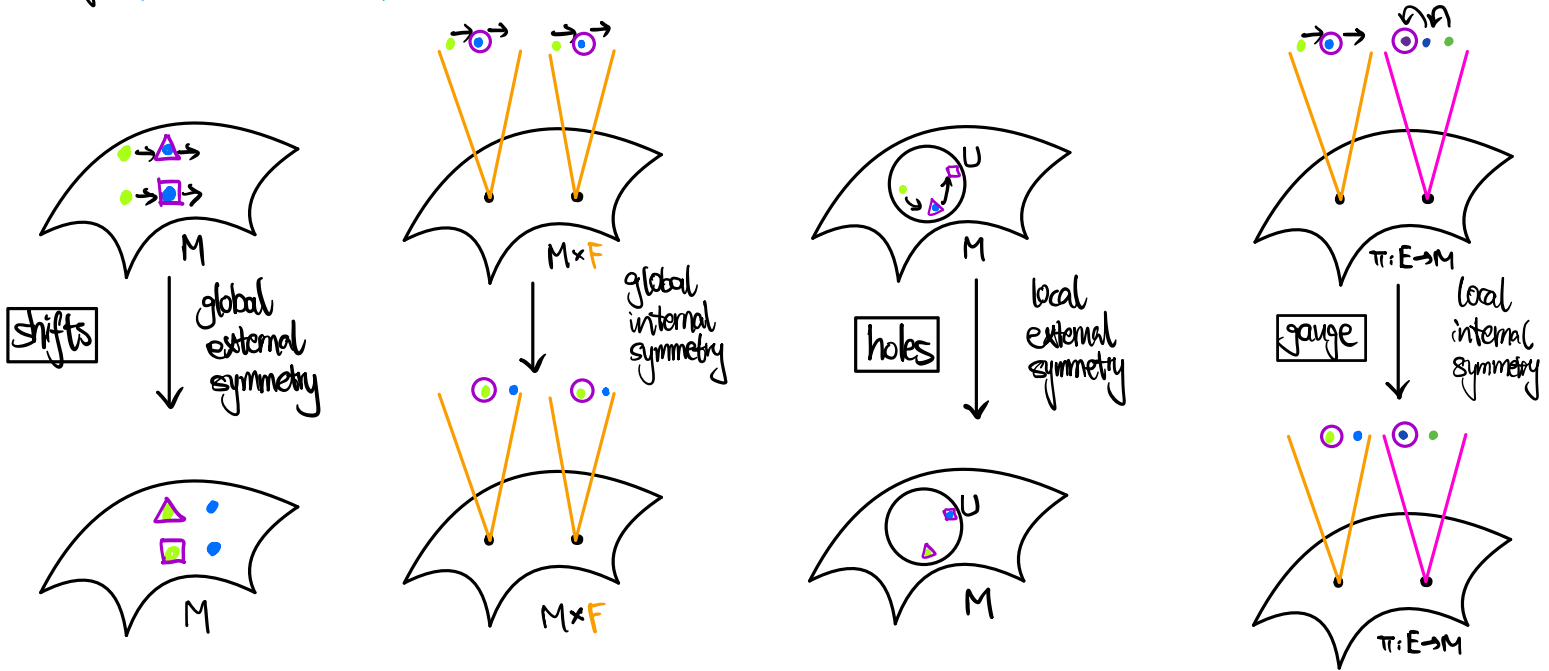
Christopher Sum 2021.10.13  
Please do not circulate!

\* "Sophistication" is borrowed from "Sophisticated Substantivalism", Dewar's paper quickly standardizes it in the literature.

## 1. Classification of Symmetries:

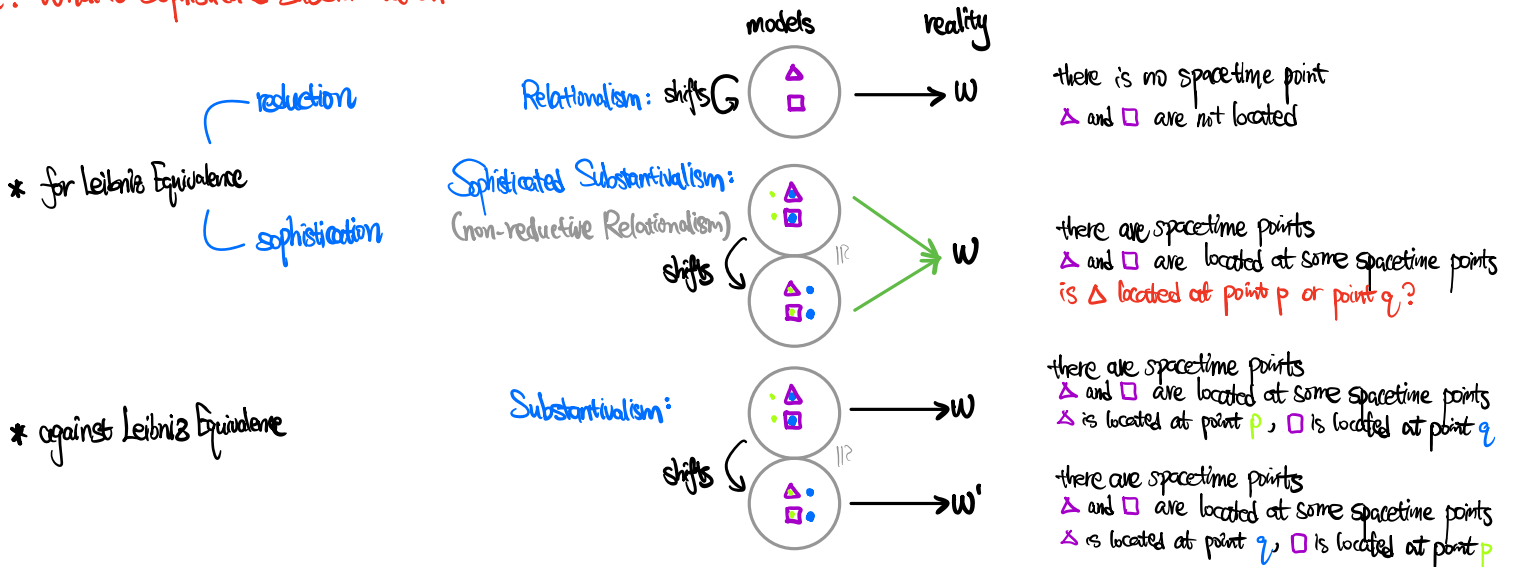
Dewar understands a symmetry as a bijection of a theory's models that satisfies certain formal properties.

In this way, symmetries form a group with actions on the class of models. Therefore, symmetries partitions models into equivalence classes (orbits).



Leibniz Equivalence: Models related by a symmetry represent same physical reality.

## 2. What is Sophisticated Substantivalism:



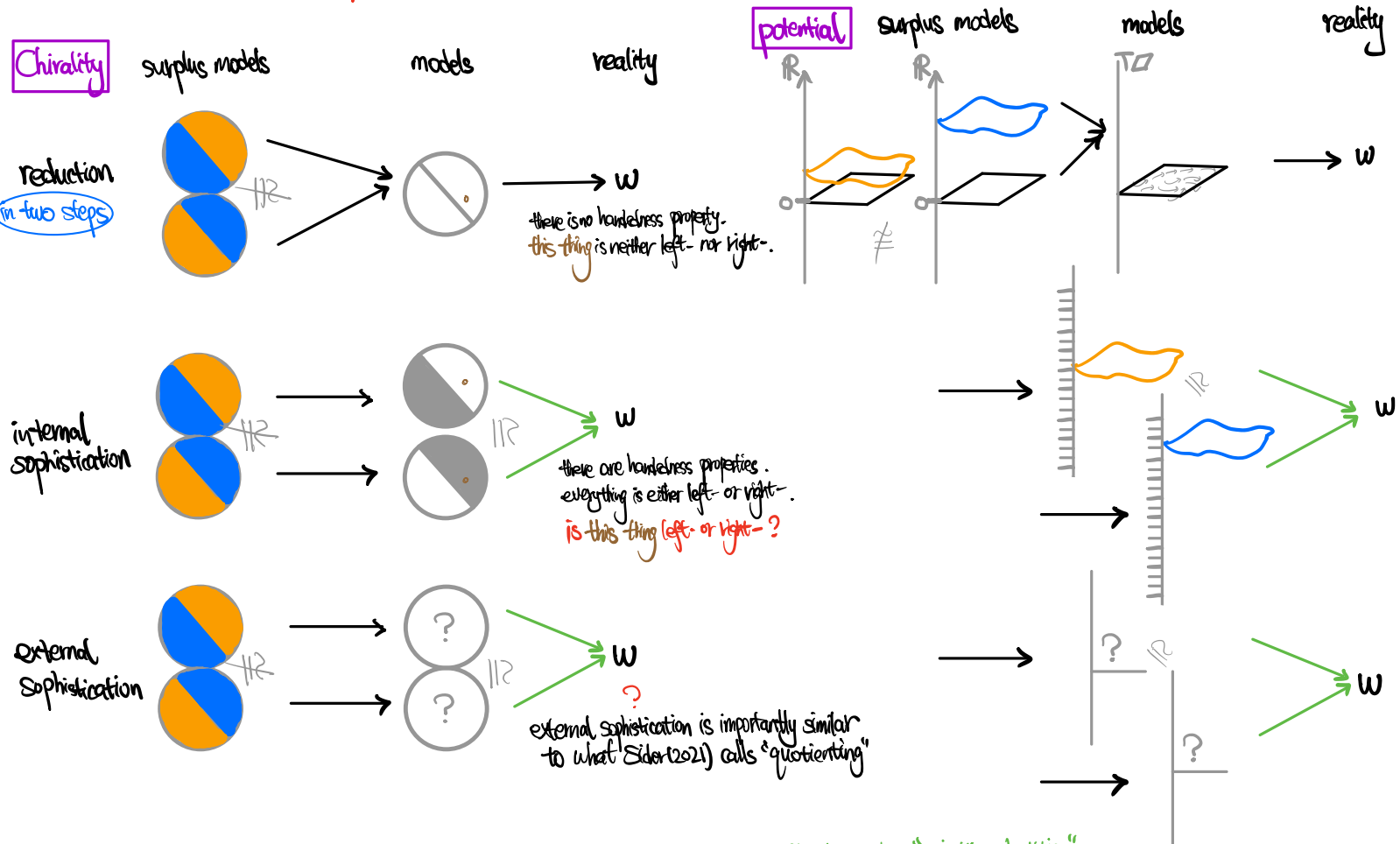
anti-haecceitism: spacetime points do not have "primitive identities"

the way philosophers of physics use this metaphysical thesis suggests that:

it is not a brute thesis about metaphysical modality, but a hyperintensional thesis about individuals.

But what exactly?

### 3. Reduction, Internal Sophistication, External Sophistication



anti-quotientism: (determinate) properties with symmetric nomic profiles do not have "primitive identities"

the way philosophers of physics use this metaphysical thesis suggests that:

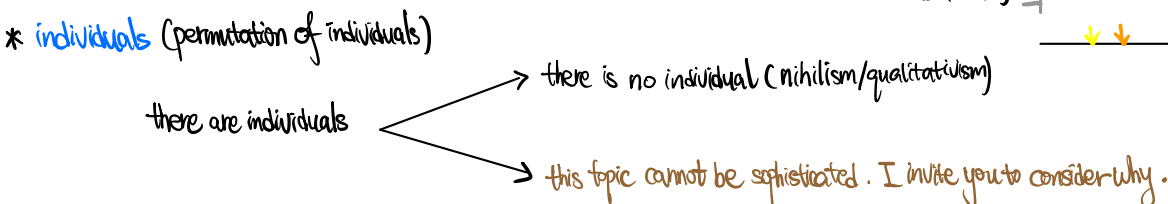
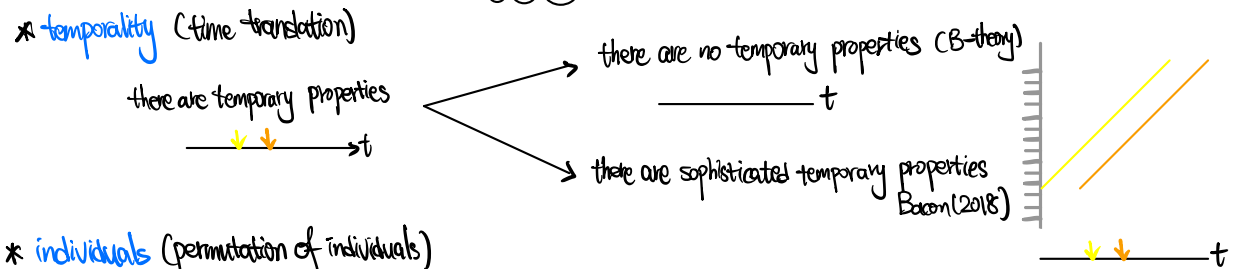
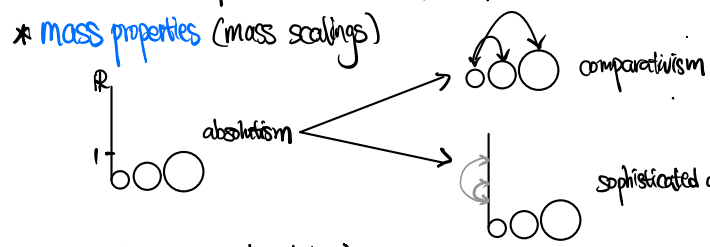
it is not a brute thesis about metaphysical modality, but a hyperintensional thesis about nomic properties.

But what exactly?

Why should we prefer internal sophistication? Explanatory virtues.

### 4. Metaphysical Reflections

We see reduction and sophistication versions of comparativism about chirality, gauge, spacetime substance. What else can we sophisticate?



and many more...