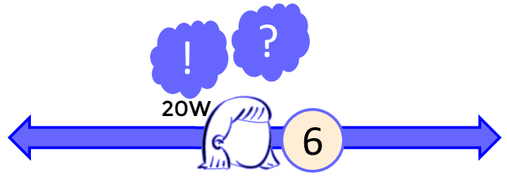
Fundamental Physics & AI

Nature



Knowledge Gain
requires resources
→ sustainability 3

Model

Experimental Methods

Algorithms 2 Mathematics

4 Near future: exponential increase

Data

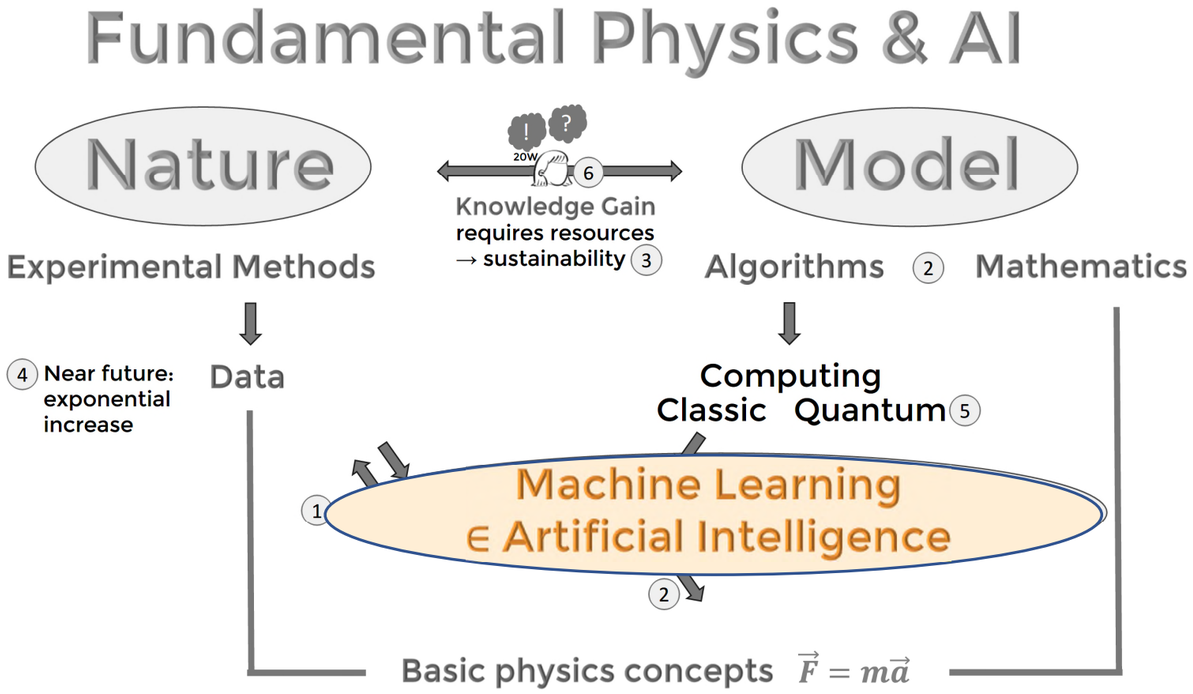
Computing
Classic Quantum 5

1

Machine Learning
∈ Artificial Intelligence

2

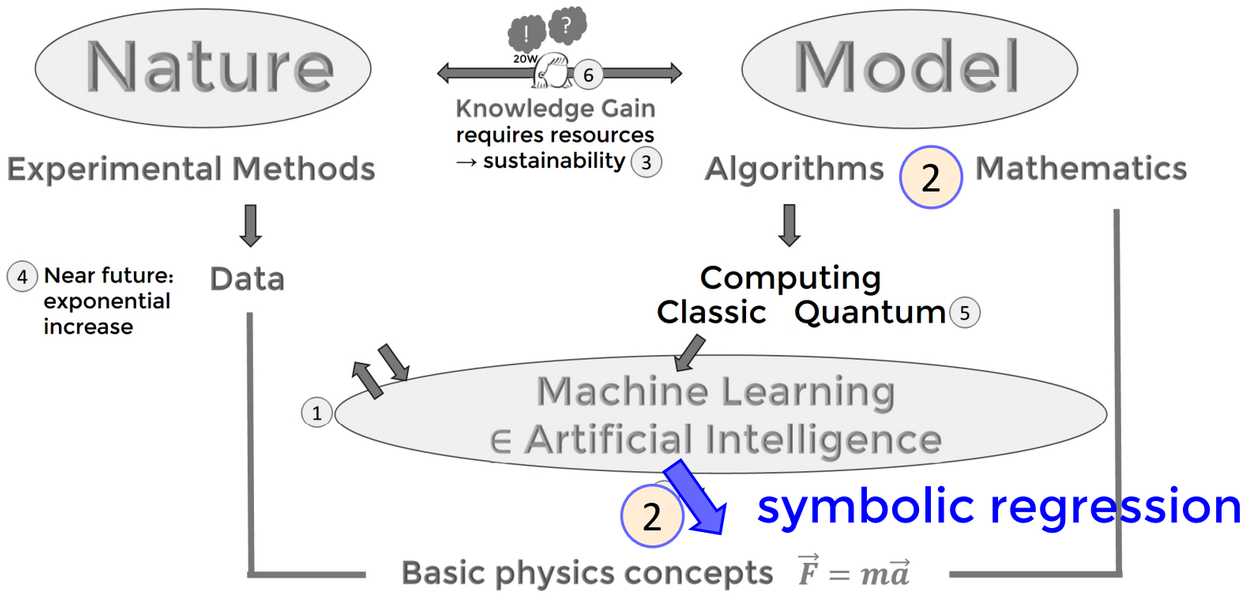
Basic physics concepts $\vec{F} = m\vec{a}$



1 Machine learning

What are your prime thoughts how `artificial intelligence´ changes fundamental science?

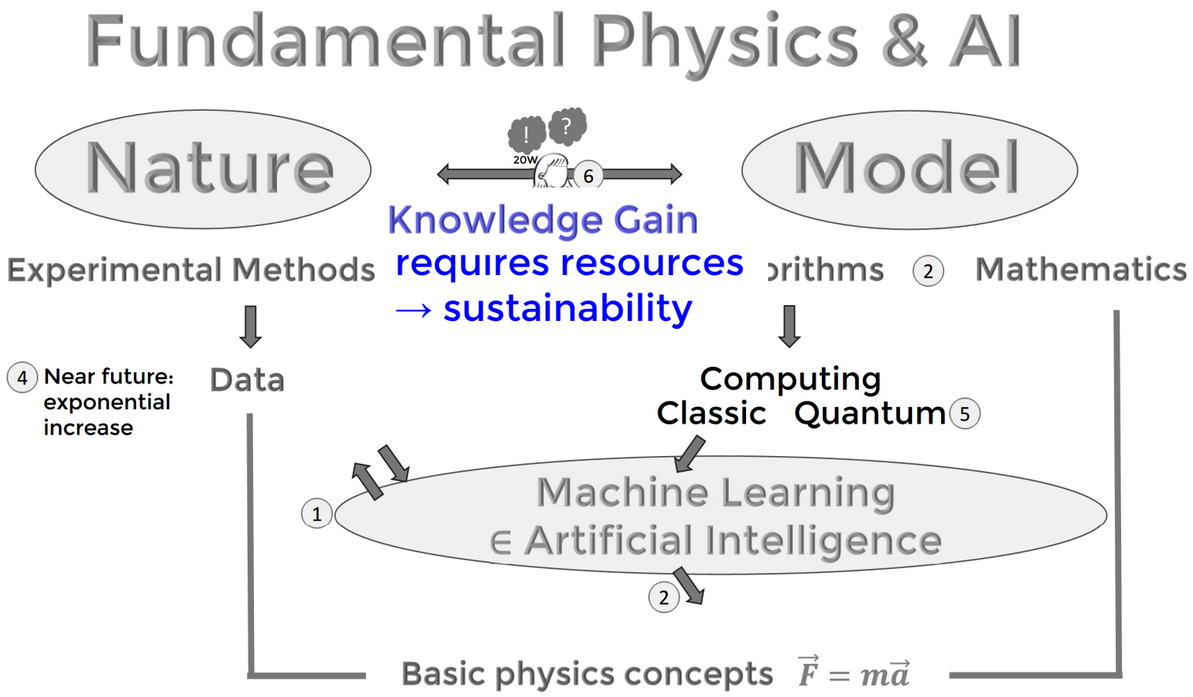
Participant Survey: In your view, what is the most important measure for progress in advancing & verifying machine learning algorithms?



2 **Algorithms and symbolic regression**

Classical basic research in physics is analytically readable ($\vec{F} = m\vec{a}$). Will this be a necessary requirement for future physics research?

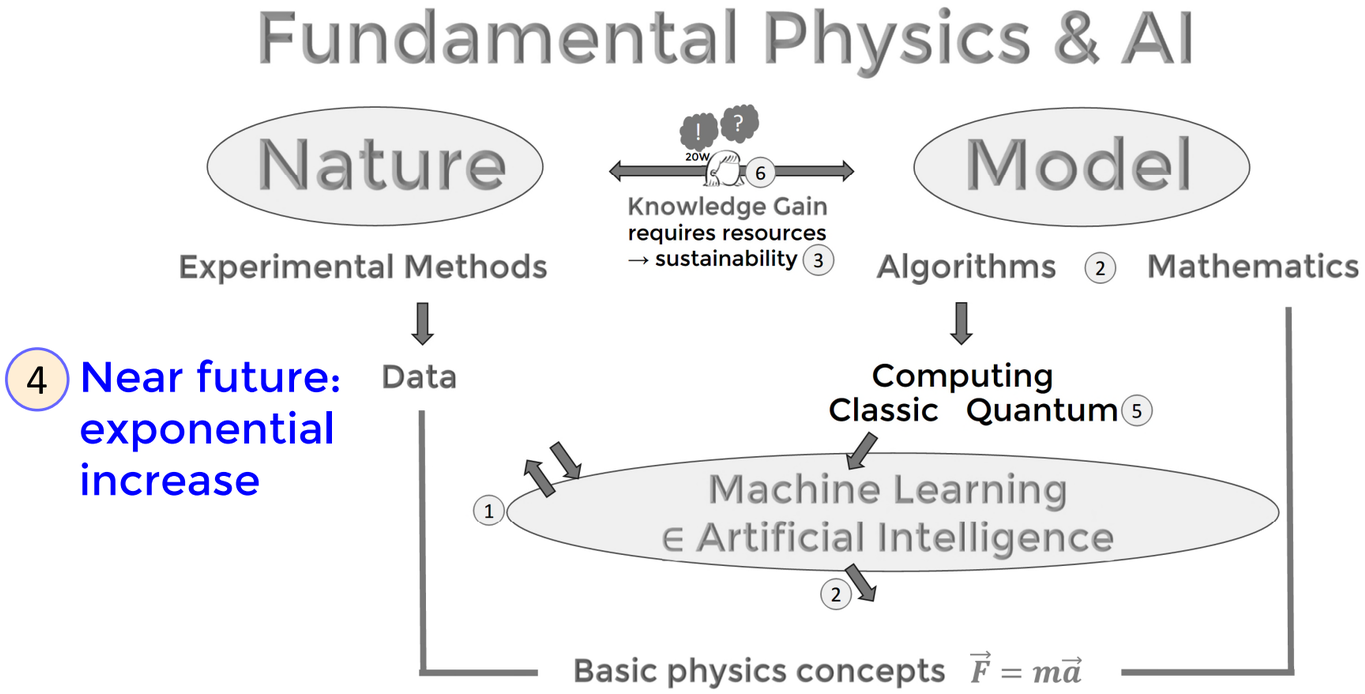
Participant Survey: Analytic expressions: Will they be a necessary requirement for future physics research?



3 Sustainability:

Do you think sustainability counts as urgent matter for fundamental science? Do you see promising areas for substantial contributions?

Participant Survey: Sustainability: points 1,…,6 I will actively contribute to in the next few years?

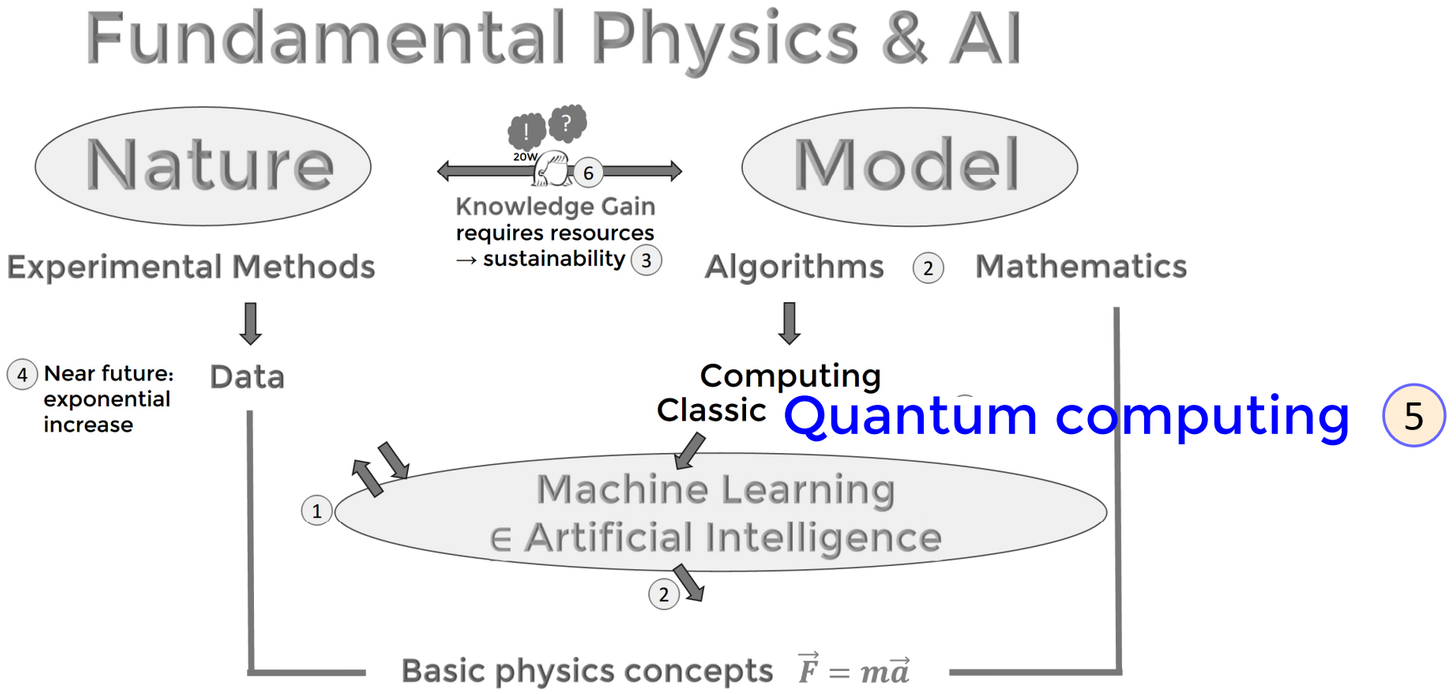


4

Exponential data growth

In the near future, we expect to see exponential growth in experimental data. How to cope with this?

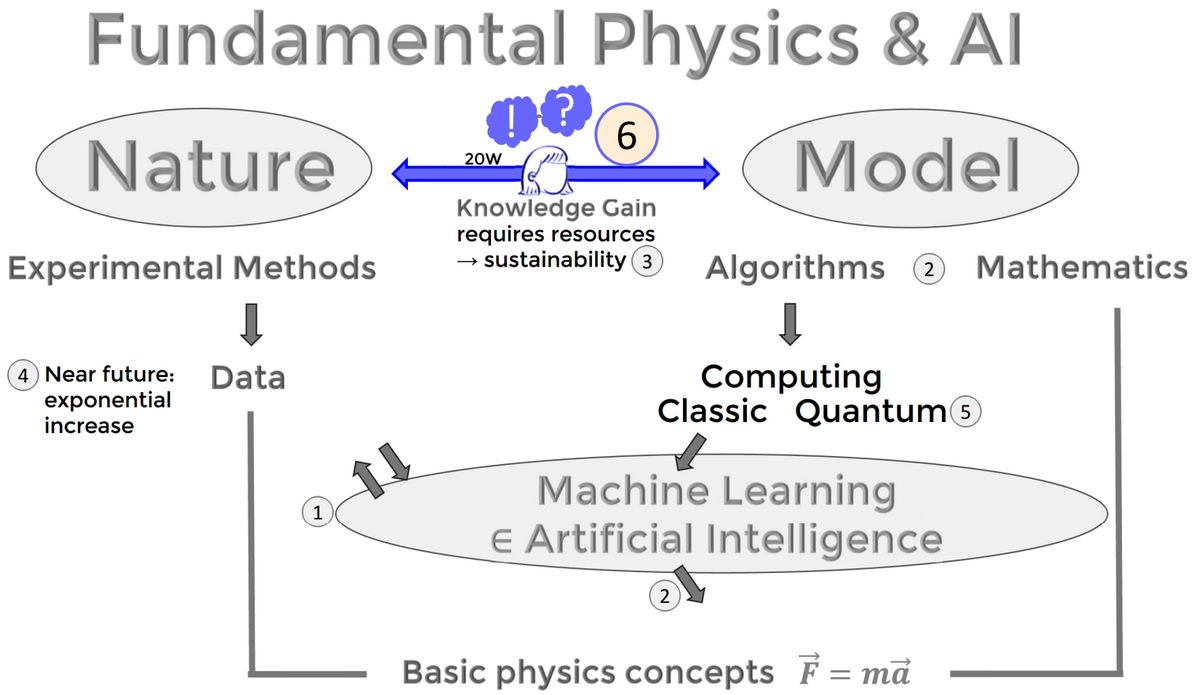
Participant Survey: My research includes advancing real-time analysis



5 Quantum computer

How high do you estimate the potential of a quantum computer in basic physics research? when do you think that quantum computers or a preliminary form will be usable?

Participant Survey: How high do you estimate the potential of a quantum computer in basic physics research? when do you think that quantum computers or a preliminary form will be usable?



6 Physicist education & job profile

What changes do you expect in the profession of physicists?
What significance do these changes have for physics education at universities?

Participant Survey: Education at my university considerably changed towards computational physics