

Math Level

The best way to describe the math level is to give examples.

You should have a good familiarity and comfort with some basic math. Examples:

- Logarithms. Using logarithms to extract power laws
- Exponential notation (e.g., 6×10^{-34} J-s)
- Complex numbers
- Probabilities (We'll tend to use the Bayesian interpretation of probability)

You should be comfortable when certain concepts are introduced and discussed. Examples:

- State variables, state space, and state vectors
- Chaos ,e.g., the average exponential exponent ("Lyapunov exponent")
- Comfort level when we talk about the conventional ideas as incorrect.
- Kolmogorov-Chaitin randomness
- Algorithms
- information measures (Shannon measures and algorithmic information), information structures
- Logic, fuzzy logic, complex logic
- Concepts such as symmetry operations or computational transformation
- Unpredictability, intractability, algorithmic irreducibility

Math note for physics, engineering, and math students:

We don't do a lot of traditional "solutions." One of the main ideas of complexity is that the traditional reductionist methods don't always work and that we need to relearn how we think. Most equations usually aren't solvable (intractability). There might not even be a way to write an equation (algorithmic irreducibility)